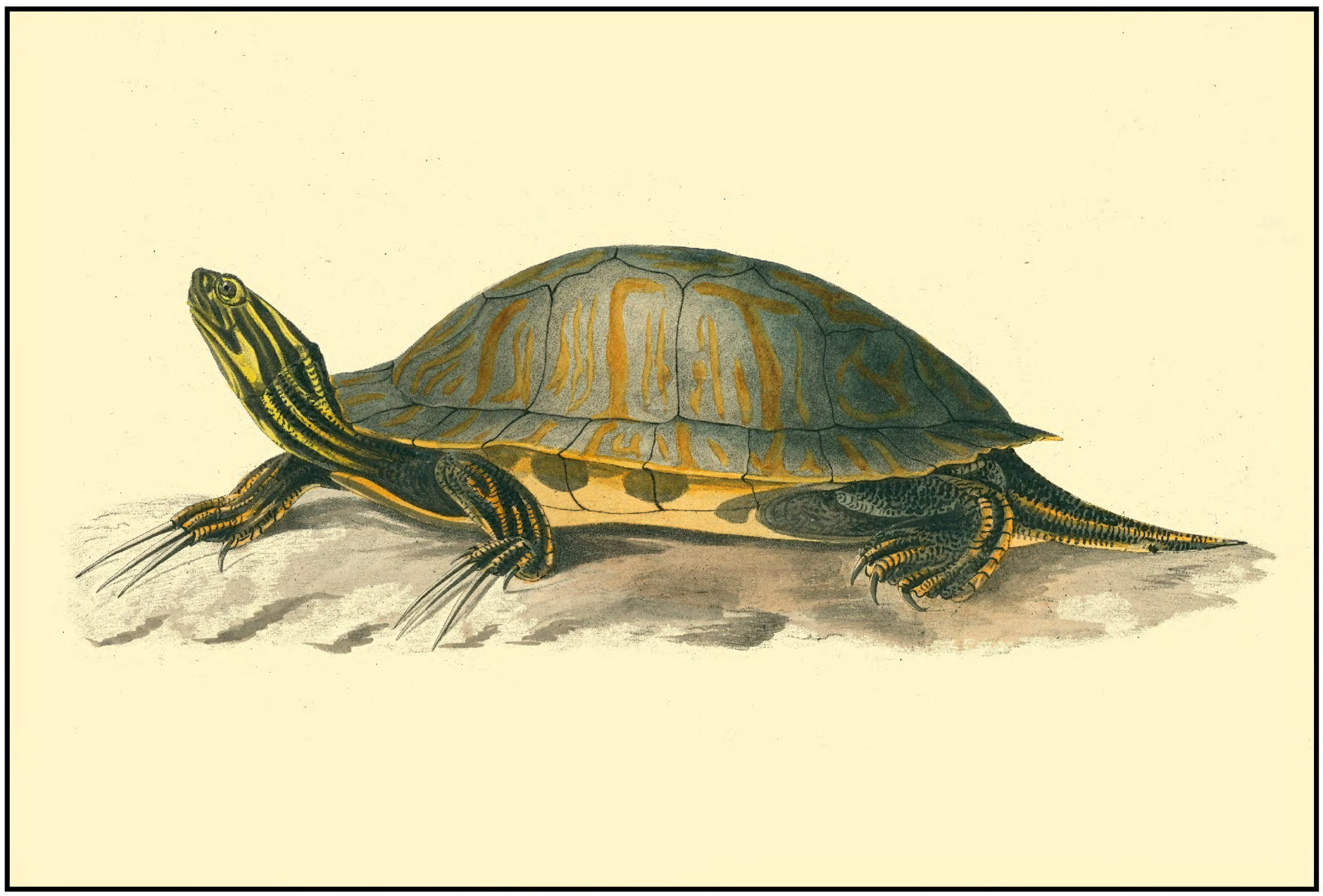
BULLETIN
of the
Chicago Herpetological Society

Volume 56, Number 5
May 2021



BULLETIN OF THE CHICAGO HERPETOLOGICAL SOCIETY
Volume 56, Number 5
May 2021

Miscellanea Herpetologica Gabonica XVII . . . . . Olivier S. G. Pauwels, Joeri A. Zwerts, José Luis Bonnin, Clay-Archange Boupoya-Mapikou, Jean-Louis Albert, Pierre Alex Dupeyras, Jan Fourie, Romaric Ndonda Makemba, Antonius E. Ruizendaal, Christian Vigna and Cédric Vermeulen 61

Book Review: *Snake Road: A Field Guide to the Snakes of Larue-Pine Hills* by Joshua J. Vossler . . . . . Mike Pingleton 69

Some Fun Observations of Gophersnakes (*Pituophis catenifer*) Near Tucson, Arizona—Part 2 . . . . . Roger A. Repp 70

Minutes of the CHS Board Meeting, April 16, 2021 83

Advertisements 84

New CHS Members This Month 84

Cover: River cooter, *Pseudemys concinna*. Drawing (as *Emys orthonyx*) by Karl Bodmer from *Verzeichniss der Reptilien, welche auf einer Reise im nördlichen America beobachtet wurde* by Maximilian, Prinz zu Wied, 1865.

STAFF

Editor: Michael A. Dloogatch—madadder0@aol.com
Copy editor: Joan Moore

2021 CHS Board of Directors

President: John Archer
Vice-president: Rachel Bladow
Treasurer: Rich Crowley
Recording Secretary: Gail Oomens
Media Secretary: Stephanie Dochterman
Membership Secretary: Mike Dloogatch
Sergeant-at-arms: Tom Mikosz
Members-at-large: Kyle Houlihan
Margaret Ann Paauw
Amelia Pollock
Immediate Past President: John Gutierrez

The Chicago Herpetological Society is a nonprofit organization incorporated under the laws of the state of Illinois. Its purposes are education, conservation and the advancement of herpetology. Meetings are announced in this publication, and are normally held at 7:30 P.M., the last Wednesday of each month.

Membership in the CHS includes a subscription to the monthly *Bulletin*. Annual dues are: Individual Membership, $25.00; Family Membership, $28.00; Sustaining Membership, $50.00; Contributing Membership, $100.00; Institutional Membership, $38.00. Remittance must be made in U.S. funds. Subscribers outside the U.S. must add $12.00 for postage. Send membership dues or address changes to: Chicago Herpetological Society, Membership Secretary, 2430 N. Cannon Drive, Chicago, IL 60614.

Manuscripts published in the *Bulletin of the Chicago Herpetological Society* are not peer reviewed. Manuscripts and letters concerning editorial business should be e-mailed to the editor, mdloogatch@chicagoherp.org. Alternatively, they may be mailed to: Chicago Herpetological Society, Publications Secretary, 2430 N. Cannon Drive, Chicago, IL 60614. **Back issues** are limited but are available from the Publications Secretary for $2.50 per issue postpaid.

Visit the CHS home page at <http://www.chicagoherp.org>.

The *Bulletin of the Chicago Herpetological Society* (ISSN 0009-3564) is published monthly by the Chicago Herpetological Society, 2430 N. Cannon Drive, Chicago IL 60614. Periodicals postage paid at Chicago IL. **Postmaster:** Send address changes to: Chicago Herpetological Society, Membership Secretary, 2430 N. Cannon Drive, Chicago IL 60614.

Copyright © 2021

Bulletin of the Chicago Herpetological Society 56(5):61-68, 2021

Miscellanea Herpetologica Gabonica XVII

Olivier S. G. Pauwels [1], Joeri A. Zwerts [2], José Luis Bonnin [3], Clay-Archange Boupoya-Mapikou [4], Jean-Louis Albert [5], Pierre Alex Dupeyras [6], Jan Fourie [7], Romaric Ndonda Makemba [8], Antonius E. Ruizendaal [9], Christian Vigna [10] and Cédric Vermeulen [11]

Abstract

We present new Gabonese locality records, ecological or morphological data for *Pelusios castaneus* (Pelomedusidae), *Kinixys erosa* (Testudinidae), *Osteolaemus tetraspis* (Crocodylidae), *Agama agama* (Agamidae), *Monopeltis galeata* (Amphisbaenidae), *Feylinia currori*, *Trachylepis polytropis* (Scincidae), *Varanus ornatus* (Varanidae), *Philothamnus hughesi*, *Rhamnophis batesii*, *Toxicodryas adamantea* and *T. blandingii* (Colubridae), *Dendroaspis jamesoni jamesoni* (Elapidae), *Bothrophthalmus brunneus*, *Limaformosa guirali* and *L. savorgnani* (Lamprophiidae), *Atheris squamigera* and *Bitis nasicornis* (Viperidae). One snake species each is newly recorded from Pongara National Park and Nyanga Province, and two each from Batéké Plateau National Park and Haut-Ogooué Province. We refer all records of *Toxicodryas pulverulenta* from Gabon to *T. adamantea*. We discuss the use of camera traps for monitoring reptiles in Gabon based on the results of extensive camera trap surveys. We provide geographic coordinates for selected localities mentioned in MHG III–VI.

Keywords

Biodiversity, herpetofauna, Testudines, Crocodylia, Squamata, camera trap, protected areas, Gabon, Equatorial Africa.

Introduction

Currently without a dedicated local or resident herpetologist, and with only occasional visits by foreign specialists, knowledge of the reptile fauna of Gabon is making slow progress, in spite of an already demonstrated high diversity. To progressively help filling gaps in the natural history and distribution of the reptiles of Gabon, the series *Miscellanea Herpetologica Gabonica* gathers original observations, mostly made by non-herpetologist field workers. Among the authors of the present installment, PAD made his herpetological observations while he was field coordinator for the Aspinall Foundation in the Batéké Plateau National Park in 2015–2016. The observations by JAZ were made during camera trap surveys to study the wildlife in various forestry concessions across Gabon; those of JLB were made during logging activities of the *Compagnie des Bois du Gabon* (CBG).

In addition to the new records presented here, we provide geographical coordinates for selected records made in former installments of the series, so that those older records can be precisely mapped (Table 2).

Material and Methods

The camera traps used by JAZ were set to take motion-triggered photos, and some also to take time-lapse photos every 15 minutes regardless of whether motion was detected. The difference in number of observations of reptiles between motion and time-lapse photos provides an indication of the efficacy of camera traps for monitoring reptiles (see Table 1). All camera traps (Bushnell Trophy Cam HD) were installed in grids with 1-km inter-camera spacing. New photographic material was identified using the keys and morphological information provided by Pauwels and Vande weghe (2008), Pauwels, Albert et al. (2010) and Pauwels, Morelle et al. (2019). Snake ventral scales were counted according to the method of Dowling (1951).

Abbreviations: Morphology: MSR = dorsal scale rows at midbody. Varia: asl = above sea level; Dept = Department; NP = National Park; Prov. = Province.

1. Department of Recent Vertebrates, Royal Belgian Institute of Natural Sciences, Rue Vautier 29, B-1000 Brussels, Belgium (corresponding author). osgpauwels@yahoo.fr

2. Institute of Environmental Biology, Department of Biology, Faculty of Science, Utrecht University, Padualaan 8, 3584 CH Utrecht, The Netherlands. j.a.zwerts@uu.nl

3. Avenida Doctor Waksman 19 puerta 8, 46006 Valencia, Spain. jlbonnin.solana@gmail.com

4. Institut de Recherche en Ecologie Tropicale (IRET), BP 13354, Libreville, Gabon. barchange@gmail.com

5. BP 5423, Libreville, Gabon. jlalbert@mac.com

6. Centre d'Etudes Biologiques de Chizé, 405 Route de Prissé la Charrière, 79360 Villiers-en-Bois, France. pa.dupeyras@gmail.com

7. Gabon Wildlife Camps & Safaris, Libreville, Gabon. jan.fourie@gabonwildlifecamps.com

8. Université de Liège - Gembloux Agro-Bio Tech, Forest is life, Terra Teaching and Research Centre, Passage des Déportés 2, B-5030 Gembloux, Belgium, and Université des Sciences et Techniques de Masuku, Institut National Supérieur d'Agronomie et de Biotechnologies, BP 941, Franceville, Gabon. r.n.makemba@gmail.com

9. toon_ruizendaal@yahoo.co.uk

10. 7, allées du Bois des Gaudiches, 91210 Draveil, France. cvigna@free.fr

11. Université de Liège - Gembloux Agro-Bio Tech, Laboratoire de Foresterie des Régions tropicales et subtropicales, Passage des Déportés 2, B-5030 Gembloux, Belgium. cvermeulen@ulg.ac.be

Table 1. Results of camera traps in logging concessions.

Logging company / concession	Number of cameras	Length of survey (days)	Total camera trap days	Motion triggered / Time-lapse	Reptile observations
Rougier Gabon – Haute Abanga	36	92	3312	Motion	2 × *Varanus ornatus*
TLP (Tropical Logs Production)	36	102	3672	Motion	3 × *Varanus ornatus*
FDG (Forestry Development Gabon)	36	62	2232	Motion	1 × *Varanus ornatus*
Rougier Gabon – Ogooué-Ivindo	28	76	2128	Motion & Time-lapse	2 × *Osteolaemus tetraspis* 1 × *Kinixys erosa* (both with Time-lapse)
BSO (Bois et Scierie de l'Ogooué)	29	90	2520	Motion & Time-lapse	2 × *Varanus ornatus* (both with Motion)
Various other concessions	166	various	12990	Motion	None

Results

Testudines
Pelomedusidae
Pelusios castaneus (Schweigger, 1812)
On 24 August 2019 JLA photographed an adult female individual 5 km south of Nyonié camp, Komo-Océan Dept, Estuaire Prov. (Figure 1). It was crossing a path at 6.15 P.M. between two forest patches in a coastal savanna. New locality record (Maran and Pauwels, 2005).

Testudinidae
Kinixys erosa (Schweigger, 1812)
On 26 April 2019 at 22.46 P.M., a time-lapse camera trap installed by JAZ in a *Rougier Gabon* logging concession (0°27'39.0"N, 11°45'43.8"E; alt. 453 m asl) in Lopé Dept, Ogooué-Ivindo Prov., photographed an adult Serrated hinge-backed tortoise (Table 1). New locality record (Pauwels and Vande weghe, 2008). Another adult was encountered by day on 16 February 2020 by JAZ on a logging road (1°54'11.6"S, 10°26'11.1"E) in Ndolou Dept, Ngounié Prov. (Figure 2). New locality record. Within the dept, the species has been listed, but not vouchered, from Mandji (Maran and Pauwels, 2005).

Crocodylia
Crocodylidae
Osteolaemus tetraspis Cope, 1861
On 5 and 18 April 2019 at respectively 3.15 A.M. and 21.29 P.M., a time-lapse camera trap installed by JAZ in a *Rougier Gabon* logging concession (0°25'28.7"N, 11°45'38.2"E; alt. 439 m asl) in Lopé Dept, Ogooué-Ivindo Prov., photographed an adult Dwarf crocodile (Table 1). New locality record (Pauwels and Vande weghe, 2008).

Squamata
Agamidae
Agama agama (Linnaeus, 1758)
On 3 October 2008 OSGP observed an adult male foraging in the late afternoon on the external wall of the *Le Méridien* hotel (0°22'40.6"N, 9°27'11.8"E) in Libreville, Estuaire Prov. It went straight up towards the top floor, at about 20 m above the ground (Figure 3). Very few data on maximum foraging heights for *Agama agama* in urban environments are available. On a house wall in Tchibanga in southern Gabon, Pauwels, Burger et al. (2004) reported foraging heights of 3 m above the ground. In southern Nigeria Amadi et al. (2020) recorded individuals foraging on walls at nearly 3 m above the ground.

Amphisbaenidae
Monopeltis galeata (Hallowell, 1852)
On 29 May 2019 JLB photographed an adult individual of this rarely encountered species at about 10 km south of Lake Divangui (thus ca. 2°01'22.4"S, 9°59'07.0"E), Ndougou Dept, Ogooué-Maritime Prov. (Figure 4). This individual was unearthed during

Figure 1. Ventral view of an adult female *Pelusios castaneus* near Nyonié camp, Estuaire Prov., northwestern Gabon. Photograph by J.-L. Albert.

Figure 2. Adult *Kinixys erosa* in Ndolou Dept, Ngounié Prov. Photograph by J. A. Zwerts.

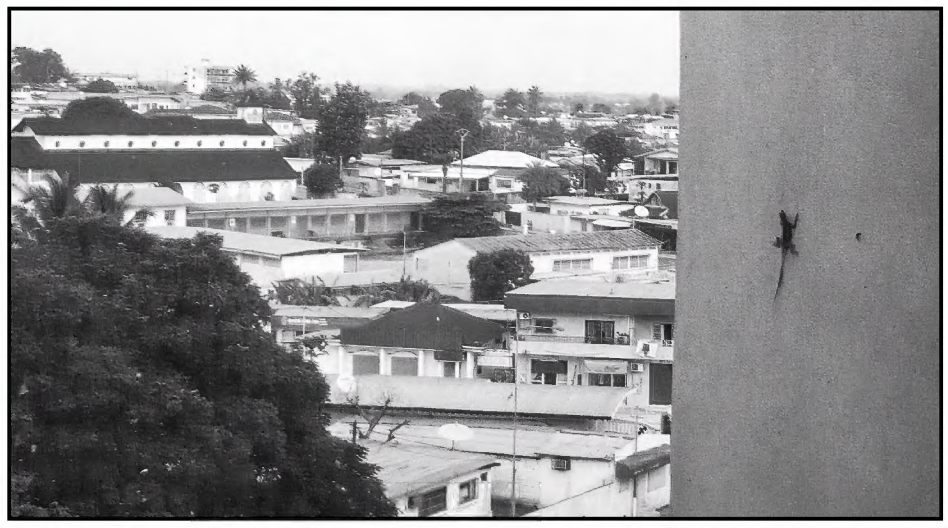


Figure 3. Adult male *Agama agama* on the wall of Le Méridien hotel in Libreville, Estuaire Prov. Photograph by O. S. G. Pauwels.

a logging operation. It was visible for a very short moment before it dug back into the soil. New locality. The closest other known localities are situated in Etimboué Dept of the same province (Branch et al., 2003).

Scincidae

Feylinia currori Gray, 1845

A freshly dead individual, about 20 cm total length and with two supranasal scales was found on 25 July 2020 by CVi along the Nyonié River in Nyonié, Komo-Océan Dept, Estuaire Prov. (Figure 5). The cause of its death is unknown. New dept record (Pauwels and Vande weghe, 2008). As is the case with amphisbaenians as well, fossorial skinks are rarely encountered, and new observations in Gabon still often represent new locality records.

Trachylepis polytropis Boulenger, 1903

On 7 November 2005, JLB caught and released an adult Multicarinated skink in the garden of the headquarters of the CBG base camp (1°50'37.6"S, 9°48'10.1"E), Etimboué Dept, Ogooué-Maritime Prov. (Figure 6). It was found active by day on the leaf litter at the edge of the forest. It showed supranasals in contact by a point, and prefrontals in wide contact. New locality. The closest earlier records were made in Rabi oil concession (Pauwels, Burger et al., 2006). The distribution of this skink in Gabon is still poorly documented.

Varanidae

Varanus ornatus (Daudin, 1803)

On 6 September 2019 at 2.55 P.M., a camera trap installed by

Figure 5. *Feylinia currori* found dead along Nyonié River, Komo-Océan Dept, Estuaire Prov. Photograph by C. Vigna.

Figure 4. Adult *Monopeltis galeata*, *in situ* in Ndougou Dept, Ogooué-Maritime Prov., southwestern Gabon. Photograph by J. L. Bonnin.

JAZ in a *Rougier Gabon* logging concession (0°39'41.4"N, 11°02'15.6"E; alt. 488 m asl) in Okano Dept, Woleu-Ntem Prov. (Table 1), photographed an adult Ornate monitor foraging on the ground. Another observation was made in the same concession on 9 October 2019 at 3:13 P.M. (0°41'19.7"N, 11°01'10.2"E; alt. 474 m asl; Figure 7). In the same dept two specimens were observed on a motion-triggered camera trap in a concession of *Bois et Scierie de l'Ogooué* (BSO; 0°32'13.3"N, 11°35'50.3"E; alt. 440 m asl; Table 1), on 6 April and 24 May 2019 at respectively 13.42 P.M. and 9.34 A.M. New locality records; previously the species was recorded from a single locality within this dept (Pauwels and David, 2008).

Three more observations were made on a logging road in a concession of *Tropical Logs Production* (TLP; 0°54'52.1"N, 10°30'43.2"E; alt. 554 m asl; Haut Komo Dept, Woleu-Ntem Prov.) on 17, 22 and 23 September 2019 at 15:09 P.M., 12:11 P.M. and 12:49 P.M., respectively. A single locality had been recorded previously for this species in this dept (Pauwels, Kamdem Toham et al., 2002).

On 1 January 2020 at 11:43 A.M., another camera trap in a *Forestry Development Gabon* (FDG) logging company's concession (1°42'43.1"S 10°13'45.2"E; alt. 185 m asl) in Ndolou Dept, Ngounié Prov., photographed an adult individual active on the ground. New locality record (Pauwels and Vande weghe, 2008).

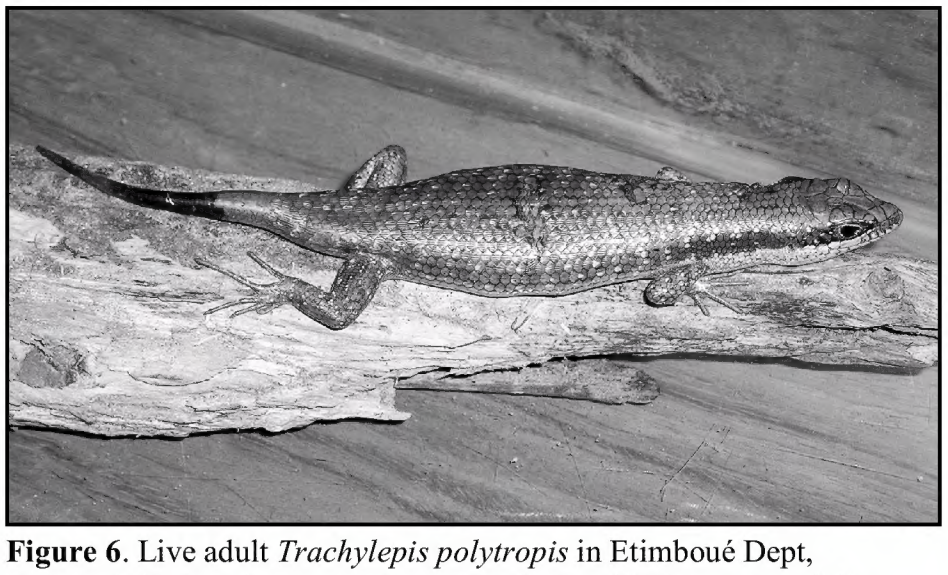


Figure 6. Live adult *Trachylepis polytropis* in Etimboué Dept, Ogooué-Maritime Prov., southwestern Gabon. Photograph by J. L. Bonnin. Note the regenerated tail.

Figure 7. Live adult *Varanus ornatus* in a logging concession in Okano Dept, Woleu-Ntem Prov., northern Gabon. Camera trap photograph by J. A. Zwerts.

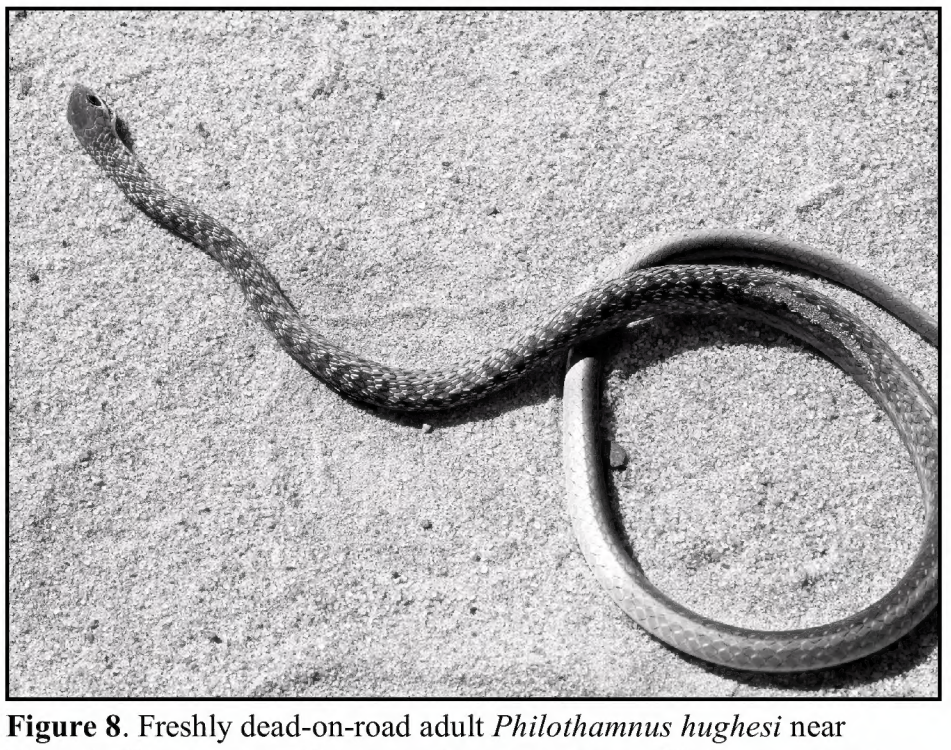


Figure 8. Freshly dead-on-road adult *Philothamnus hughesi* near Moanda, Haut-Ogooué Prov., southeastern Gabon. Photograph by C.-A. Boupoya-Mapikou.

Figure 9. Live *Rhamnophis batesii* in Mouloundou Dept, Ogooué-Lolo Prov., southeastern Gabon. Photograph by R. Ndonda Makemba.

Figure 10. Freshly dead-on-road adult *Dendroaspis jamesoni jamesoni* near Nyonié, Estuaire Prov., western Gabon. Photograph by C. Vigna. The head is heavily damaged.

Figure 11. Live adult *Bothrophthalmus brunneus* in Batéké Plateau NP, Haut-Ogooué Prov., southeastern Gabon. Photograph by P. A. Dupeyras.

Figure 12. Live adult *Limaformosa guirali* in Batéké Plateau NP, Haut-Ogooué Prov., southeastern Gabon. It is flicking its dark pink tongue. Photograph by P. A. Dupeyras.

All monitors photographed by camera trap showed five dorsal transverse rows of ocellae between fore- and hind-limb insertions, a pattern typical of *Varanus ornatus*. A simultaneous camera trap survey effort in various other concessions across Gabon revealed no reptiles (Table 1).

Colubridae

Philothamnus hughesi Trape & Roux-Estève, 1990

On 25 October 2018 CABM photographed a freshly dead-on-road adult individual in a savanna area (1°35'37.1"S, 13°16'49.6"E) located SE of Moanda in Lébombi-Léyou Dept, Haut-Ogooué Prov. (Figure 8). It showed smooth dorsal scales, a dark green head, irregular blue and black oblique bars on the neck, and a bronze dorsum irregularly dotted with black. The two photographs taken allow seeing that on the right side of the head, there are eight supralabials of which the 4th and 5th contact the orbit, and that the temporal formula is 1+1. First Dept record. This relatively recently described, colorful species was confirmed from Gabon only two years ago (Pauwels, Morelle et al., 2019), and only two Gabonese localities were known previously, both in Lékoko Dept.

Rhamnophis batesii (Boulenger, 1908)

On 26 March 2020 RNM photographed a Bates's tree snake active by day in a forest (0°49'15.1"S, 13°16'57.1"E; alt. 345 m asl) near Mamidi in Mouloundou Dept, Ogooué-Lolo Prov. (Figure 9). Photographs in ventral view show keeled ventrals, a single anal scale and divided subcaudals. New locality record (Pauwels and Vande weghe, 2008; Carlino and Pauwels, 2015). There are still only a very few records of this arboreal snake in Gabon; it is much more rarely observed in the country than the congeneric *Rhamnophis aethiopissa aethiopissa*, for reasons that are still unknown to us.

Toxicodryas adamantea Greenbaum, Allen, Vaughan, Pauwels, Wallach, Kusamba, Muninga, Mwenebatu, Mali, Badjedjea, Penner, Rödel, Rivera, Sterkhova, Johnson, Tapondjou & Brown, 2021

The caption of the photograph presented by Spawls and Branch (2020: 239) to illustrate *Toxicodryas pulverulenta* gives "Gabon" as locality, without more precision. The young individual on the photograph was actually found in Rabi oil concession (ca. 1°55'34.5"S, 9°52'12.8"E), Etimboué Dept, Ogooué-Maritime Prov., by the late Bill Branch (author of the photograph), Marius Burger and OSGP. Following the revision of the genus *Toxicodryas* by Greenbaum et al. (2021), all records of *T. pulverulenta* from Gabon should be referred to *T. adamantea*.

Toxicodryas blandingii (Hallowell, 1844)

Spawls and Branch (2020: 238) provided the photograph of a young individual from "Gabon." It was more precisely taken in the garden of the villa (Case 62; 2°46'21.0"S, 10°02'02.6"E) which OSGP occupied from 2004 to 2011 in Yenzi near Gamba, Ogooué-Maritime Prov. The Blanding's tree snake was the most often encountered snake species in this garden during this period. *Toxicodryas adamantea*, found by OSGP in syntopy in the same garden, was comparatively very rare.

Elapidae

Dendroaspis jamesoni jamesoni (Traill, 1843)

In the early morning of 17 May 2020 CVi found a freshly dead-on-road individual (about 1.7 m total length) near the *Campement Chez Beti* (0°02'22.2"S, 9°20'23.7"E), Komo-Océan Dept, Estuaire Prov. (Figure 10). Jameson's mamba was recently found for the first time in Estuaire Prov., where it is so far known from only a few localities (Pauwels, Bamba Kaya et al., 2020; Pauwels, Chirio et al., 2017; Pauwels, Pauly et al., 2020).

Lamprophiidae

Bothrophthalmus brunneus Günther, 1863

On 16 April 2015 PAD photographed an individual at night in the northern part of Batéké Plateau NP, Plateaux Dept, Haut-Ogooué Prov., in direct proximity to human settlements. Its dorsum is uniformly brown (Figure 11). The dorsal surface of its head is brown-orange, indicating that it is adult (young individuals show a whitish head). New record for the park and for Haut-Ogooué Prov. (Pauwels and Vande weghe, 2008; Pauwels, 2016). This is the southeasternmost record of the genus *Bothrophthalmus* in Gabon and, like all other Gabonese records, it is not a lineated individual. *Bothrophthalmus lineatus* Peters, 1863, although mentioned several times by various authors from Gabon, is unvouchered from the country and should not be treated as a synonym of the uniformly brown form *B. brunneus* (Pauwels and Vande weghe, 2008; Pauwels and Brecko, 2020).

Limaformosa guirali (Mocquard, 1887)

On the evening of 17 April 2015 PAD encountered an adult Guiral's file snake in the northern part of Batéké Plateau NP, Plateaux Dept, Haut-Ogooué Prov. (Figure 12). Photographs of its whole body and of the right side of its head show a uniformly black dorsum (i.e., without a white spot on each scale), a white belly (the black dorsal color extends to the edges of the ventrals), a relatively short tail, 15 MSR, strongly keeled dorsals with a vertebral row bearing a double keel, a frontal of about the same length as the parietals, a divided nasal, a single loreal,

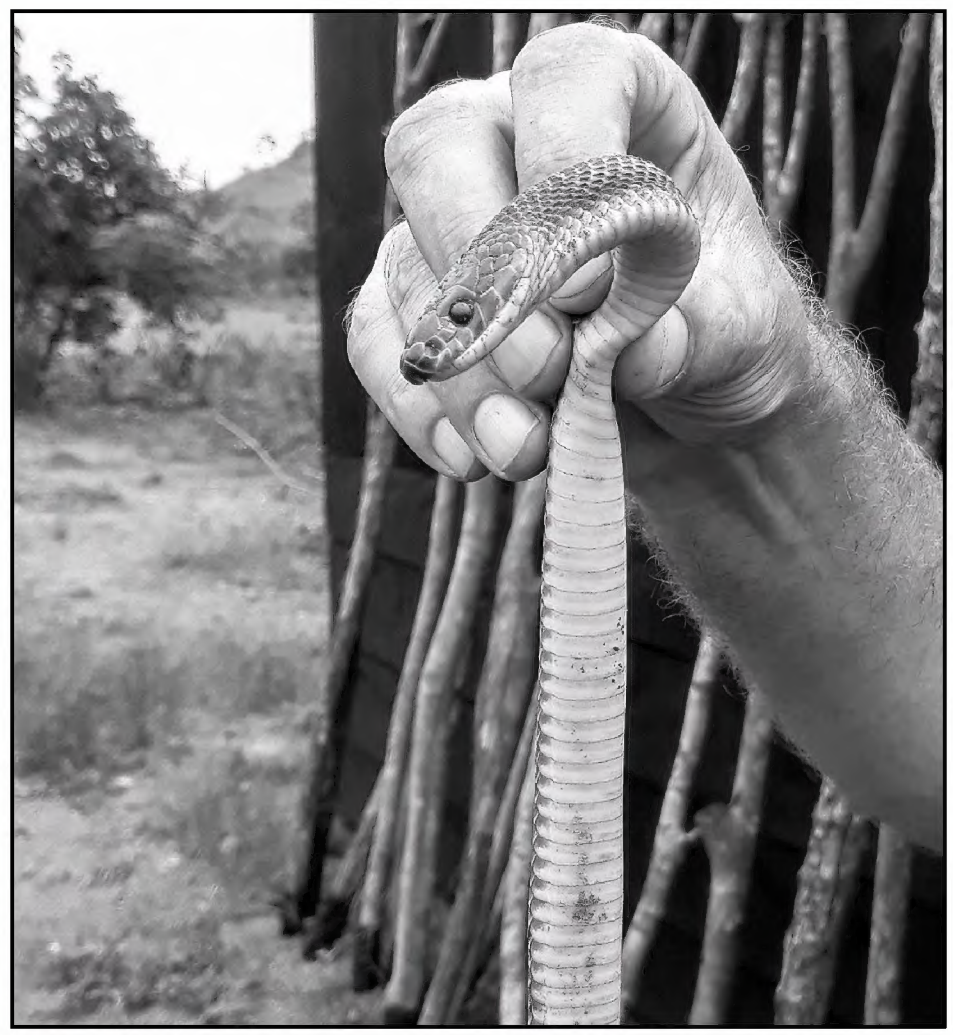


Figure 13. Live adult *Limaformosa savorgnani* near Tchibanga, Nyanga Prov., southern Gabon. Photograph by A. E. Ruizendaal.

Figure 14. Live subadult *Atheris squamigera* in Mouloundou Dept, Ogooué-Lolo Prov., southeastern Gabon. Photograph by R. Ndonda Makemba.

2 preoculars, 2 postoculars, 7 supralabials of which the 3rd, 4th and 5th contact the orbit, 8 infralabials, and 2 anterior temporals. New record for the park and for Haut-Ogooué Prov. (Pauwels and Vande weghe, 2008; Pauwels, 2016; Pauwels, Gillet et al., 2018). With the present additions of *Bothrophthalmus brunneus* and *Limaformosa guirali*, 18 reptile species are now recorded from Batéké Plateau NP, obviously only a fraction of the actual number of species inhabiting the park.

Limaformosa savorgnani (Mocquard, 1887)
An adult individual was found by AER on 19 May 2020 inside a house (2°57'35.8"S, 10°59'45.9"E) near Tchibanga in Mougoutsi Dept, Nyanga Prov. Various photographs of its body (among them Figure 13) show a black dorsum with a white spot on each scale, a white belly (the black dorsal color extends to the edges of the ventrals), a relatively short tail, 15 MSR, strongly keeled dorsals with a vertebral row bearing a double keel, a frontal as broad as long, shorter than the parietals, a divided nasal, 1/1 loreal, 1/1 preocular, 0/0 postocular (fused on each side with the supraocular), 7(3-4)/7(3-4) supralabials, 8(5)/8(5) infralabials, 1/1 anterior temporal, about 220 keeled ventrals, a single anal and a complete tail with 52 divided subcaudals. Parietal and frontal scales rugose. Its total length is about 102 cm. New prov. record (Pauwels and Vande weghe, 2008; Pauwels and Sallé, 2009; Dewynter et al., 2017; Pauwels, Albert et al., 2017; Pauwels, Bamba Kaya et al., 2020).

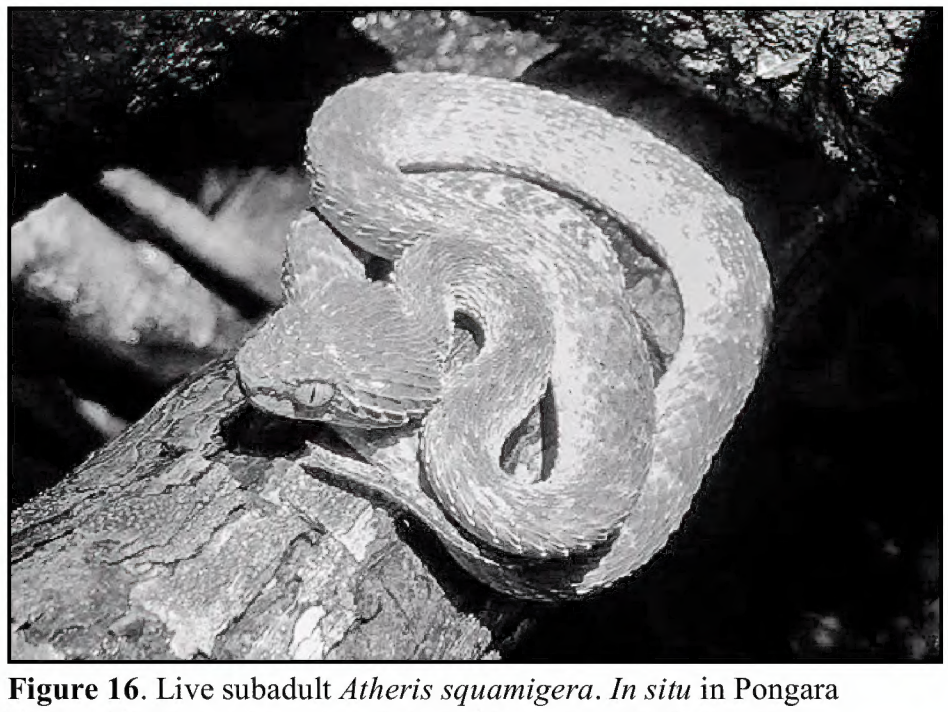


Figure 16. Live subadult *Atheris squamigera*. *In situ* in Pongara National Park, northwestern Gabon. Photograph by J. Fourie.

Figure 15. Live adult *Atheris squamigera* in Mouloundou Dept, Ogooué-Lolo Prov., southeastern Gabon. Photograph by R. Ndonda Makemba.

Viperidae
Atheris squamigera (Hallowell, 1856)
On 24 and 25 March 2020 RNM encountered a subadult and an adult Green tree viper in forest sites (0°49'51.0"S, 13°17'6.8"E, alt. 373 m asl, and 0°49'14.6"S, 13°17'3.2"E, alt. 350 m asl, respectively) near Mamidi in Mouloundou Dept, Ogooué-Lolo Prov. (Figures 14 and 15). Photographs in ventral view of the second individual showed its single anal and allowed counting its single preventral and 157 ventrals. Both showed a green dorsal color, with poorly contrasted irregular transverse bands in the subadult. New localities (Pauwels, Chirio et al., 2017). On 1 April 2020 at 11.40 A.M. JF photographed a subadult individual in a forest (ca. 0°12'10.1"N, 9°19'13.7"E) in the western part of Pongara NP, Komo-Océan Dept, Estuaire Prov. (Figure 16). New record for the park and for the dept (Pauwels, Le Garff et al., 2016; Pauwels, Chirio et al., 2017). Including this new record, 26 reptile species are currently recorded from Pongara NP (Pauwels, 2016; Pauwels, Albert et al., 2017; Pauwels, Gillet et al., 2018), a list that is certainly still very incomplete.

Bitis nasicornis (Shaw, 1802)
An adult Nose-horned viper was photographed by JLB on 13 Sept. 2014 at the CBG base camp (1°50'37.6"S, 9°48'10.1"E), Etimboué Dept, Ogooué-Maritime Prov. (Figure 17). New locality. The closest records were made in Rabi oil concession (Pauwels, Burger et al., 2006). On 10 December 2017 CVe

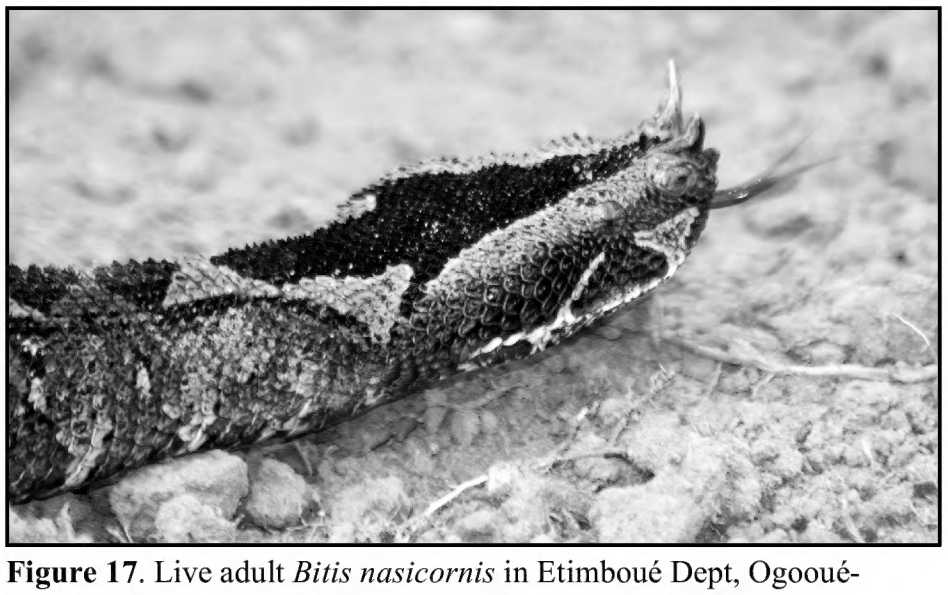


Figure 17. Live adult *Bitis nasicornis* in Etimboué Dept, Ogooué-Maritime Prov., southwestern Gabon. It is flicking its black tongue. Photograph by J. L. Bonnin.

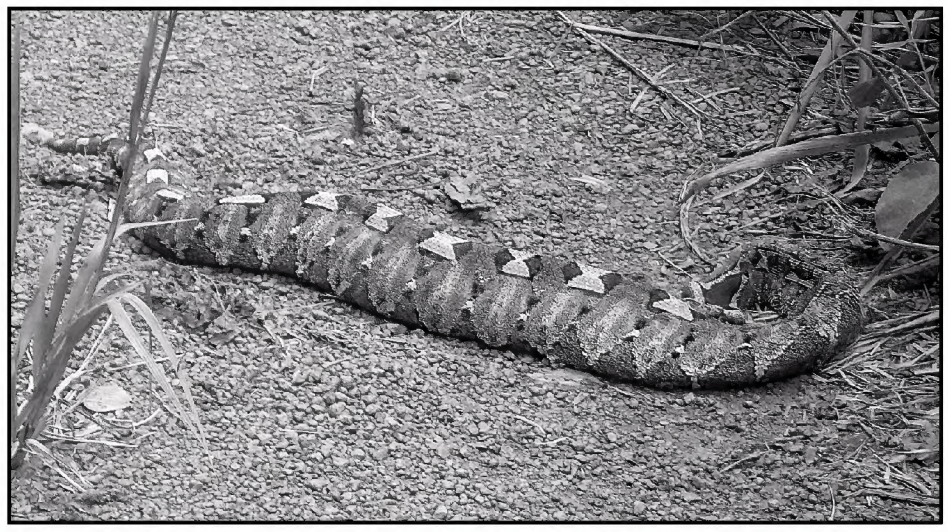


Figure 18. Freshly dead-on-road adult *Bitis nasicornis* near Bambidié, Ogooué-Lolo Prov., eastern Gabon. Photograph by C. Vermeulen.

photographed an adult individual (Figure 18) on a laterite road (0°46'00.0"S, 12°54'00.0"E) near Bambidié, in a concession of the *Compagnie Equatoriale des Bois* (CEB), Mouloundou Dept., Ogooué-Lolo Prov. The freshly dead snake had just been run over by a car whose driver ate the viper the same day. New locality record (Pauwels and Vande weghe, 2008).

Remark on camera traps for reptile monitoring in Gabon

In the extensive camera trap surveys of JAZ (Table 1), only eight observations of reptiles, all of adult *Varanus ornatus*, were made with motion-triggered cameras. A small portion of the cameras was also set up to take time-lapse photos on 15-minute intervals, thereby not depending on heat and/or motion triggers. Interestingly, the time-lapse cameras observed two other reptile species, in particular adult *Kinixys erosa* and *Osteolaemus tetraspis*. A potential explanation for the lack of observations of these species on motion-triggered cameras is that these species may move too slow to trigger the camera. Time-lapse camera trapping partly addresses this issue, but comes at the cost of producing enormous numbers of empty images with related data processing costs. Overall, it can be concluded that camera trapping is of limited value for herpetological inventories due to limited detection.

Acknowledgments

OSGP will never thank enough Michael (Mike) Dloogatch for his support to the publication of the Miscellanea Herpetologica Gabonica, through his excellent editorial skills, enthusiasm and the numerous improvements he brings to each installment of the series. H. E. Lee J. T. White (Ministre des Eaux, de la Forêt, de la Mer, de l'Environnement, chargé du Plan Climat, des Objectifs de Développement Durable et de l'Affectation de Terre) kindly facilitated communication among co-authors of the present MHG installment.

Table 2. Geographic coordinates for selected localities mentioned in Miscellanea Herpetologica Gabonica (MHG) III–VI (localities alphabetically arranged).

Localities	Province	Coordinates	MHG
Akiéni (ca. 10 km S of)	Haut-Ogooué, Lékoni-Lékori Dept	1°15'07.6"S, 13°55'23.3"E	IV
Bakoumba	Haut-Ogooué, Lékoko Dept	1°49'43.5"S, 13°00'08.7"E	V–VI
Boussimbi	Ogooué-Lolo, Offoué-Onoy Dept	1°10'32.0"S, 11°49'16.0"E	IV
Hôtel Tropicana, Libreville	Estuaire Prov., Libreville Dept	0°26'56.3"N, 9°24'43.1"E	V–VI
Terminal pétrolier	Ogooué-Maritime, Ndougou Dept	2°46'41.7"S, 10°01'12.2"E	III
Wagny	Ogooué-Lolo, Mouloundou Dept	0°34'31.3"S, 12°17'21.6"E	IV
Yenzi	Ogooué-Maritime, Ndougou Dept	2°46'04.0"S, 10°01'36.4"E	III

Literature Cited

Amadi, N., R. Belema, H. Obodo Chukwu, D. Dendi, A. Chidinma, R. Meek and L. Luiselli. 2020. Life in the suburbs: Artificial heat source selection for nocturnal thermoregulation in a diurnally active tropical lizard. Web Ecology 20:161-172. <https://doi.org/10.5194/we-20-161-2020>

Branch, W. R., O. S. G. Pauwels and M. Burger. 2003. Re-discovery of *Cynisca bifrontalis* in Gabon, with additional notes on *Monopeltis galeata* (Reptilia: Amphisbaenia). African Journal of Herpetology 52(2):93-100.

Carlino, P., and O. S. G. Pauwels. 2015. An updated reptile list of Ivindo National Park, the herpetofaunal hotspot of Gabon. Bulletin of the Chicago Herpetological Society 50(3):25-39.

Dewynter, M., L. Chirio, F. Melki, J. Cordier and T. Frétey. 2017. Premières données herpétologiques (Amphibiens et Reptiles) sur le massif du Koumouna-Bouali (Gabon). Les cahiers de la fondation Biotope 11:1-42.

Dowling, H. G. 1951. A proposed standard system of counting ventrals in snakes. British Journal of Herpetology 1(5):97-99.

Greenbaum, E., K. E. Allen, E. R. Vaughan, O. S. G. Pauwels, V. Wallach, C. Kusamba, W. M. Muninga, M. A. Mwenebatu, F. M. M. Mali, G. Badjedjea, J. Penner, M.-O. Rödel, J. Rivera, V. Sterkhova, G. Johnson, W. P. Tapondjou and R. M. Brown. 2021. Night stalkers from above: A monograph of *Toxicodryas* tree snakes (Squamata: Colubridae) with descriptions of two new cryptic species from Central Africa. Zootaxa 4965(1):1-44.

Maran, J., and O. S. G. Pauwels. 2005. Etat des connaissances sur les tortues continentales du Gabon: Distribution, écologie et conservation. Bulletin de l'Institut Royal des Sciences naturelles de Belgique 75:47-60.

Pauwels, O. S. G. 2016. Annexe 5. Liste des reptiles. Pp. 364-366. *In*: Vande weghe, J. P., P. Christy, M. Ducrocq, M. Lee, G. Vande weghe and O. S. G. Pauwels. Biodiversité des parcs nationaux et réserves du Gabon. 2. Espèces, écosystèmes et populations. Libreville, Gabon: Agence Nationale des Parcs Nationaux.

Pauwels, O. S. G., J.-L. Albert, H. Arrowood, C. Mvele, M. Casanova, J.-B. Dodane, J. Morgan, L. Primault, L. Thepenier and J. N. Fenner. 2017. Miscellanea Herpetologica Gabonica X. Bulletin of the Chicago Herpetological Society 52(8):133-138.

Pauwels, O. S. G., J.-L. Albert and G. L. Lenglet. 2010. Reptilia, Amphisbaenidae, *Monopeltis schoutedeni* de Witte, 1933: First record from Gabon, with an updated key to Gabonese worm lizards. Check List 6(3):476-478.

Pauwels, O. S. G., A. Bamba Kaya, L. Boundenga, P. Carlino, L. Chirio, M. J. Moreels, S. Morelle, B. Ngoubangoye, L. Pallemaerts and K. A. Abernethy. 2020. Miscellanea Herpetologica Gabonica XV. Bulletin of the Chicago Herpetological Society 55(3):54-60.

Pauwels, O. S. G., and J. Brecko. 2020. Book review. Snakes of Central and Western Africa. Herpetological Review 51(1):161-164.

Pauwels, O. S. G., M. Burger, W. R. Branch, E. Tobi, J.-A. Yoga and E.-N. Mikolo. 2006. Reptiles du Complexe d'Aires Protégées de Gamba, sud-ouest du Gabon. Pp. 91-100. *In*: Alonso, A., M. E. Lee, P. Campbell, O. S. G. Pauwels and F. Dallmeier, editors. Gamba, Gabon: Biodiversité d'une forêt équatoriale africaine / Gamba, Gabon: Biodiversity of an equatorial African rainforest. Washington, D.C.: Bulletin of the Biological Society of Washington (12).

Pauwels, O. S. G., M. Burger, S. Guimondou and W. R. Branch. 2004. *Agama agama* (Linnaeus, 1758). Red-headed Rock Agama. Nocturnal activity. African Herp News (37):20-21.

Pauwels, O. S. G., L. Chirio, E. J. Neil, S. Berry, N. Texier and C. Rosin. 2017. Miscellanea Herpetologica Gabonica VIII. Bulletin of the Chicago Herpetological Society 52(3):41-46.

Pauwels, O. S. G., and P. David. 2008. Miscellanea Herpetologica Gabonica I. Hamadryad 32(1):13-18.

Pauwels, O. S. G., J.-F. Gillet, Y. G. Ongonwou Sonnet and L. Chirio. 2018. Miscellanea Herpetologica Gabonica XII. Bulletin of the Chicago Herpetological Society 53(5):105-110.

Pauwels, O. S. G., A. Kamdem Toham and C. Chimsunchart. 2002. Recherches sur l'herpétofaune des Monts de Cristal, Gabon. Bulletin de l'Institut Royal des Sciences Naturelles de Belgique 72:59-66.

Pauwels, O. S. G., B. Le Garff, I. Ineich, P. Carlino, I. Melcore, L. Boundenga, C. Vigna, T. Stévart, K. Jeffery, C. Orbell, J.-B. Squarcini, J. P. Vande weghe and L. J. T. White. 2016. Miscellanea Herpetologica Gabonica V & VI. Bulletin of the Chicago Herpetological Society 51(11):177-185.

Pauwels, O. S. G., S. Morelle, J.-L. Albert, P. Carlino, N. Rahola and J.-F. Trape. 2019. New reptile records from Lékédi Park and Haut-Ogooué Province, southeastern Gabon. Amphibian & Reptile Conservation 13(1):143-161.

Pauwels, O. S. G., M. J. L. Oger and D. Meirte. 2018. Miscellanea Herpetologica Gabonica XIII. Bulletin of the Chicago Herpetological Society 53(7):145-151.

Pauwels, O. S. G., A. Pauly, A. Araldi, R. Ndonda Makemba, D. Fonteyn, R. Oslisly and A. M. Whittaker. 2020. Miscellanea Herpetologica Gabonica XVI. Bulletin of the Chicago Herpetological Society 55(5):93-99.

Pauwels, O. S. G., and B. Sallé. 2009. Miscellanea Herpetologica Gabonica III. Hamadryad 34(1):22-27.

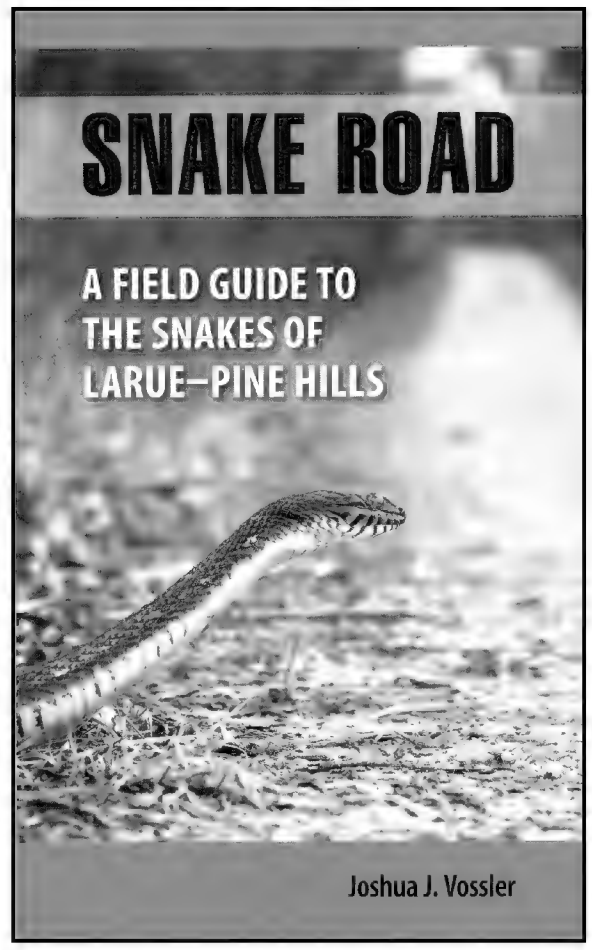
Pauwels, O. S. G., and J. P. Vande weghe. 2008. Reptiles du Gabon. Washington: Smithsonian Institution.

Spawls, S., and B. Branch. 2020. The dangerous snakes of Africa. London: Bloomsbury Wildlife.

Book Review: *Snake Road: A Field Guide to the Snakes of Larue-Pine Hills* by Joshua J. Vossler 2021. Shawnee Press, Southern Illinois University Press. 152 pp. Softbound. $19.50

Mike Pingleton
pingleto@gmail.com

Southern Illinois holds a place of pilgrimage for those interested in amphibians and reptiles. Every autumn people journey from all over the United States and even other countries to walk along Snake Road, a few miles east of the Mississippi, to observe serpents making their way to their winter dens. I myself have made the journey there many, many times since my first visit in 1977. I have written about Snake Road for *Herp Nation* magazine and elsewhere, as well as providing a number of interviews to news media. I mention this as it likely plays into why I was asked to review Joshua Vossler's new book on the subject.



The book is a good size to fit into a day pack and bring along. It covers all of the snakes known to occur at Snake Road. In Part One, each species is accorded an account with a description, and there are plenty of photos to help with identification. Some species vary in color and pattern, and these differences are addressed, a very useful feature. The organization of species accounts is somewhat confusing, as they are listed in declining order according to the "cottonmouth ratio," or how many cottonmouths you might observe, on average, before you see that particular serpent. The timber rattlesnake, for example, has a cottonmouth ratio of 57:1. Along with the ratio the "probability of seeing one" is listed, which for the timber rattler, is "1 visit, 17%; 4 visits, 52%; 10 visits, 84%".

Vossler derived these ratios and probabilities from statistics gathered from 100 visits to Snake Road, across three consecutive years and visits in both spring and fall. In the preface Vossler writes that he was new to the area and relatively inexperienced with the herpetofauna, which can be helpful to readers with the same inexperience. His fresh-eyed perspective works elsewhere in the book, but I don't think the cottonmouth ratio is very useful, unless the reader also plans on making 100 visits to Snake Road. In my experience, observing snakes and other herpetofauna in the field is hardly a cut-and-dried affair that fits into a neat statistical model. Each season in a given year will be different from any other year, and of course any given day will vary from other days, so I worry that the cottonmouth ratio and a set of probabilities may set unrealistic expectations, or perhaps add an element of despair. Statistics are interesting but I'm not sure that arranging the book around them was the best approach. Part Two is titled "How to Tell Similar Snakes Apart" and this is where Vossler's fresh perspective shines. Using many photos, he compares species from a number of different angles, including "black snakes," very useful given that there are many dark-colored snakes that can confuse inexperienced snake observers. The venomous cottonmouth is compared to harmless water snakes, and the cottonmouth and copperhead are also compared to each other, useful since juveniles of each form are often confused. There are too many other comparisons to list here but they are all handy in helping readers sort things out, and I think this is the best portion of the book.

I need to touch on the naming conventions used in the book. Vossler uses the SSAR's list of names, and only to the species level, which may be technically correct (depending on your perspective), but many of them may prove awkward and unfamiliar to readers. "North American Racer" is the most glaring example; while it correctly encompasses the wide-ranging *Coluber constrictor*, it is too generic a term, and "Southern Black Racer" would be more appropriate to use for the subspecies occurring at Snake Road, and more familiar to readers. "Northern Cottonmouth" and "Eastern Copperhead" are also problematic, as many people are more familiar with the names "Western Cottonmouth" and "Northern Copperhead," and those newer names are still contentious and not widely accepted. Far better and less confusing to simply use the terms "Cottonmouth" and "Copperhead." Names are important, and I would have liked to see more attention and detail given to them, rather than simply referring to an academic list outside of the reader's easy reach.

The introduction contains useful information about visiting Snake Road, including how to get there, rules and regulations, and what to bring and what to wear for walking the road. I wish it had more details on the history of the road, and more about the intersecting biogeographical provinces that make Snake Road such a special place. The strengths of the book lie in the comparisons found in Part Two, and in the many detailed photographs that newcomers to snakes and Snake Road will find useful in identifying what they encounter. For those planning a visit, I would suggest also bringing along either a state or regional field guide, to identify many other kinds of amphibians and reptiles that also occur at Snake Road and the surrounding area.

Bulletin of the Chicago Herpetological Society 56(5):70-83, 2021

Some Fun Observations of Gophersnakes (*Pituophis catenifer*) Near Tucson, Arizona—Part 2

Roger A. Repp
9044 N. Valgrind Lane
Tucson, AZ 85743
repproger22@gmail.com

Before diving into Part 2 of this column, a little review is in order. Through a process best described as more luck than brains, in Part 1 the author broke down the various observations on Gophersnakes into shorter segments. Each segment carried a sequentially numbered subtitle. The numbering was initially done to use as a comparative guideline between some heretofore unpublished observations by local herpetologists, and what may or may not be in the Gophersnake chapter of the recently published book, *Snakes of Arizona*. What did "we" miss? What did "they" miss? We'll *all* know soon enough. Meanwhile, a side benefit of the numbered sections in Part 1 allows for a simple review of what was written in last month's column, as follows:

Figure 1. Like many snakes in the Sonoran Desert, Gophersnakes tend to prefer cheap canned beer. Image by Michael Cardwell. See also Figure 4.

1. Playing kissy-face with a Gophersnake: Two different herpers suffered a high-speed smooch from two different Gophersnakes.

2. Let's call them "PICA": The author combined the first two letters of *Pituophis* and the first two letters from *catenifer* to create the word PICA. The words "PICA" and "Gophersnake" will be used interchangeably in this piece as well.

3. Fun with PICA vs. literature about PICA: This section dealt with the lack of information in the literature on the natural history of our cool, Tucson-area colubrids, in contrast to the relatively abundant info on our rattlesnakes.. The first mention of the combination of Marty Feldner, Roger Repp, Jim Rorabaugh and Don Swann being dubbed "The Tucson Four" was included in this section. Finally, the upcoming head-to-head comparison between the field observations of the Tucson Four with the Gophersnake chapter in *Snakes of Arizona* was mentioned. (See also Section 8 below).

4. Three huge Arizona PICAs: Two Gophersnakes from Tucson, and one from the town of Happy Valley (north of Phoenix) that were seven feet long (or longer) were mentioned, along with images of the two from Tucson.

5. Who is eating who? PICA and ground squirrels: The author rants about two species of ground squirrels that Gophersnakes either eat, or are eaten by. A Marty Feldner image of a round-tailed ground squirrel harassing an adult PICA is brought into play, as are two *excellent* Phillip Brown images of a PICA choking one down. These images came via the Tucson Herpetological Society (THS) website (Repp, 2002).

6. PICA ambush postures?: Armed with Marty Feldner's images, as well as his own, the author describes what may be lie-and-wait ambush strategies of young Gophersnakes. The observations culminate with a more mature PICA briefly holding a similar posture before plunging into the hole it had staked out. Two young hopper kangaroo rats then jetted out of nearby escape holes, while the snake remained down. For whatever reason, I scared myself away from suggesting that entering a dark hole for a meal might be a spooky endeavor for a young PICA. And the process of fearlessly diving into a tight hole might be a learned behavior.

7. *Dig this*! An observation of a PICA excavating a hole: Some notes and images of an observation from Don Swann, who witnessed a ~1 meter total length female Gophersnake digging a hole. If the reader wants to know more about any of the contents of Part 1, may I suggest that you read the article?

Without further ado, we are done with the review, and move on to:

8. Some fun observations of Gophersnakes (*Pituophis catenifer*) near Tucson, Arizona

The words that conclude these columns are not necessarily the last words that are written. The words at the end of this section will be the last words that I write before I submit this column for publication. Everything else is done. All the way through Section 18, the reproduction section, is done. My intent was to next write a review of the Gophersnake account in the book *Snakes of Arizona*. But time (today is 30 April), and the already excessive column length have forced me to apply the brakes. I will do a much better and more thorough job of reviewing the work of the authors of the Gophersnake account if I am not rushed. What I'm really saying is that the readers of this column can look forward to a Part 3 PICA column. I'm sure that this is reason enough *not* to drink your can of drain cleaner *until* you have read Part 3. Keeping you all alive is but another small part of what your columnist does for herpetology—not to mention humanity.

Before I read the Gophersnake account, I want to first emphasize why it was so important to me to restrict everything I say to Arizona-only observations. I am fond of informing people that something of herpetological significance that routinely happens in "my" canyon might *not* happen in the next canyon over. The best example of this sort of thing is the *major* difference in how Western Diamond-backed Rattlesnakes (*Crotalus*

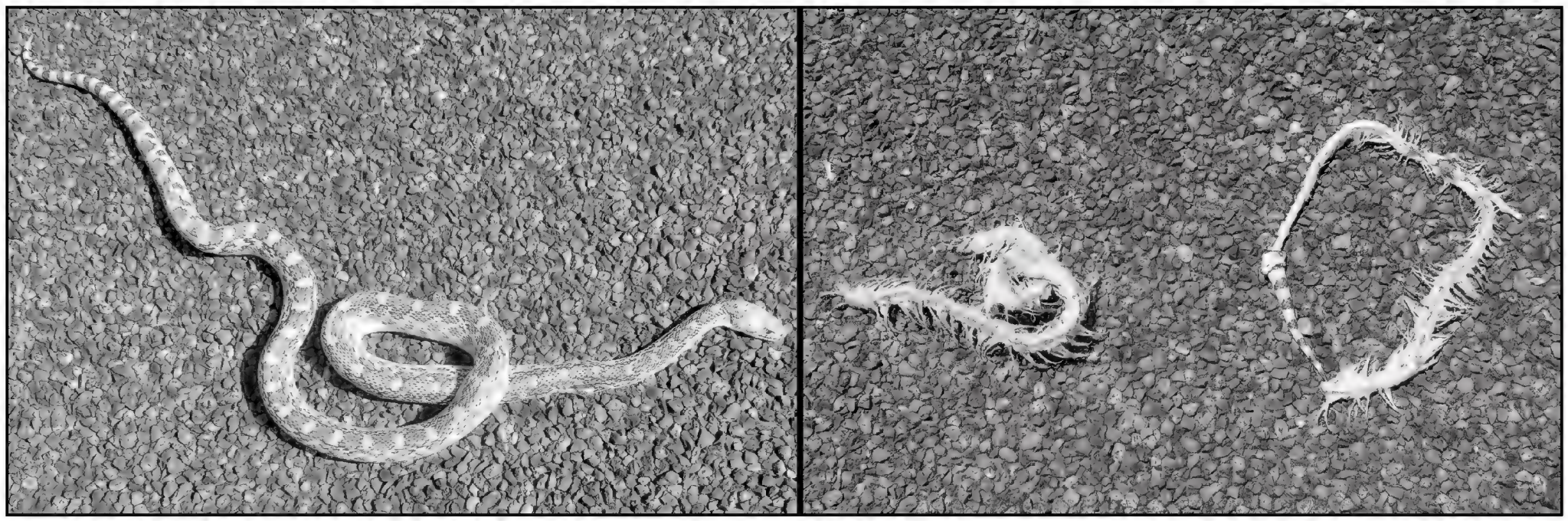


Figure 2. The author purposefully points out in the text that DOR snakes do not last long on Arizona's roads. (Left) An approx. 1.3-meter total length DOR PICA as found at 0910 hrs on 3 June 2019. (Right) What remained of the PICA at 1113 hours the same day—2 hours, 3 minutes later. Images by the author.

atrox) overwinter on two patches of ground that are only three miles apart. The Gordon Schuett and Roger Repp study in the Suizo Mountains located eight different *Crotalus atrox* communal dens of five or more individuals. During the exact same time period, a study conducted only three miles distant, under the generalship of Emily Taylor and Dale DeNardo, found that *Crotalus atrox* rarely if ever co-inhabited an overwintering site (Dale DeNardo, pers. comm.) Three miles apart! When discussing the *Pituophis* clan, we are dealing with a type of snake whose range blankets nearly the entire continental USA, not to mention parts of Canada and Mexico. What they do, and when they do it, is going to be different if we consider snakes that reside in Texas and compare them to those hailing from British Columbia. I am doing my best to keep my/our observations as local as possible. A small example of how much the Arizona-only restriction has impacted this effort can be found in Section 14 below. The loggerhead shrike is listed as a *potential* predator of PICA there. Howard Clark, who is the editor of the *Sonoran Herpetologist*, presented his eyewitness account of a loggerhead shrike predation attempt on a hatchling PICA (Clark, 2011). But his observation happened in California. While I *still* have not read the aforementioned Gophersnake account, I have read enough other chapters in *Snakes of Arizona* to know that the book draws heavily on out-of-state observations. I see no reason to expect the Gophersnake account to be any different. Lastly, before I go into the last words of this section and column, most of what follows is still under the realm of the Tucson Four. However, once I got to reproduction (Section 18), I went *all out* to glean every observation that I could. That effort included websites, peer-reviewed publications, and lots of personal communication. I *even* cracked open some books!

(May 1, 2020): Hmm, as I suspected! There are observations from all over the place on PICA! I have finally read the Gophersnake account in *Snakes of Arizona* (Babb et al., 2020). Despite the observations from nearly every place *but* Arizona, my approval rating for this chapter is still sky high. Since we will dive more deeply into this next month, there is no need to say any more at this point. I am *so very glad* to finally have this book in hand. I am somewhat crushed that I was not given the opportunity to participate. The reader can expect to see a boatload of sniveling about that! Next month, we will separate the flyscat from the pepper, tell you what *they* got, and what *we* got! There is no question that this chapter would have been better with *us*.

9. PICA: The most encountered colubrid near Tucson

The results of my independent study, which is basically a 26½-year-long, nonstop herp survey of Southern Arizona, clearly indicate that Gophersnakes are my most commonly encountered colubrid snake. While PICA are indeed number one for the harmless snakes under my watch, they are actually in third place if we consider the numbers of *all* snakes found. Bring on the rattlesnakes! The reader will no doubt think me a *big, fat liar* with some of the numbers that come next. That is why my field journals often remind me: "There is no need to exaggerate, the truth is unbelievable enough." The year 1997 was a bad journal year for this author. Hence, it has been eliminated from all numbers about to be presented. The numbers discussed in Sections 9, 10 and 11 represent 26.5 years of field effort, from July 1989 through 2016. During that time, the numbers of the top five snakes encountered near Tucson are as follow: Western Diamond-backed Rattlesnakes (*Crotalus atrox*): 3,011; Sidewinders (*Crotalus cerastes*): 775; Gophersnakes (*Pituophis catenifer*): 629; Coachwhips (*Masticophis flagellum*): 453; Long-nosed Snakes (*Rhinocheilus lecontei*): 373. Hey! This is fun! But in going through this massive dataset, I have also observed some sobering stuff. We speak of "DORs."

10. A few words about Dead On Road (DOR) snakes

Most of the people I herp with tend to look at a DOR snake as something of no value. Not so with this herpetologist! To be sure, a live one is always better to see. But where my counts are concerned, a DOR snake is valuable data, and is worth as much as a live one. All of the numbers under Section 9 above *include* DOR snakes. The discerning herpetologist might say "Roger, if that snake had not been killed you would not have seen it." That is mostly true. But there are times that I actually see a road mortality happen. There are also those dreadful occasions when this killer author smacks his own forehead while mournfully uttering: "*Oh Magoo—you've done it again*!" Yes, the list that follows includes my own contributions to any DOR snake totals. In Arizona, with very few exceptions, a DOR snake normally disappears within 24 hours of being killed (Figure 2). Many times, even on the most remote dirt roads, they last less than one

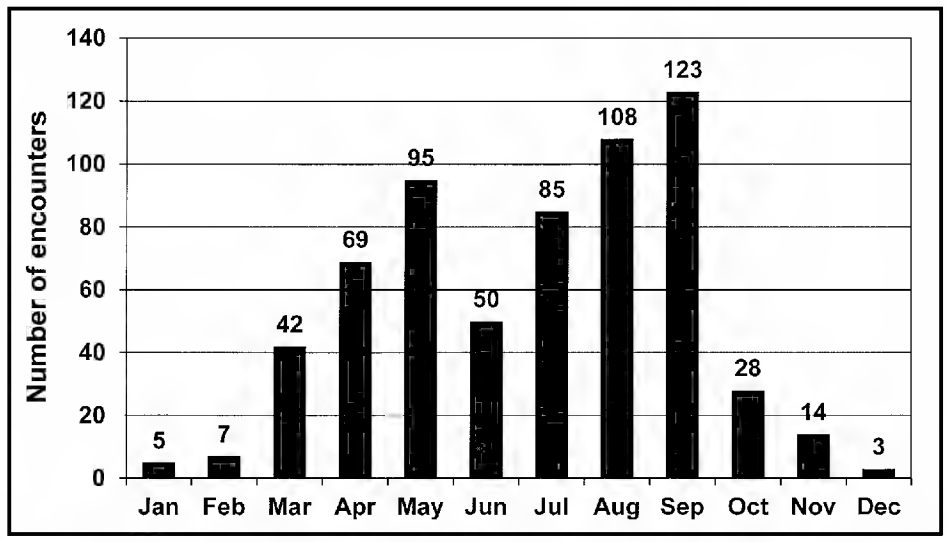


Figure 3. Distribution by month of 629 *Pituophis catenifer* encountered in Arizona during the course of 26.5 years of fieldwork by the author. The numbers were tallied from 3,592 field excursions between the years 1989 through 2016, and include both live and DOR individuals.

hour. As the reader will see in Section 11 below, *all* of my snake activity data is presented on a monthly basis. A DOR snake found on either 1 June or 30 June demonstrates *only* that this snake was active during the month of June. The numbers do not indicate that a 1 June DOR snake was "found in June—but *almost* found in May." And a 30 June DOR does not indicate that said DOR was "found in June—but *almost* found in July."

We'll take a fast look at the "sobering stuff" mentioned earlier. If we look at the top five species of snake that were mentioned above, and look at the number of DORs as simple percentages to the total number of encounters, the list goes like this: Western Diamond-backed Rattlesnakes (*Crotalus atrox*): 14%; Sidewinders (*Crotalus cerastes*): 29%; Gophersnakes (*Pituophis catenifer*): 55% (ouch!); Coachwhips (*Masticophis flagellum*): 42%; and Long-nosed Snakes (*Rhinocheilus lecontei*): 70% (*really* ouch!). While the author could easily speculate as to why the numbers shake out this way, it would be beyond the scope of this article to do so.

11. Activity patterns of PICA

The reader is invited to take a look at Figure 3. It is a very easy-to-understand overview of the activity patterns of Gophersnakes around the Tucson vicinity. At a glance, we can see that surface active PICA have been encountered every month of the year. They have two peak active seasons, spring and summer. What the chart does not show is that the majority of PICA encountered in May are adults, while August and September are when the hatchlings appear in force. See the caption to Figure 3 for further pertinent details.

12. PICA are *not* beer snobs

Putting the fun back into this article, the reader is invited to refer to Figures 1 and 4. It takes a mighty brave beer drinker to admit to drinking Miller Lite, but Gophersnakes scoff at those of their human counterparts who look down on any who don't drink their highbrow, stick-in-the-throat, overpriced microbrews. The delightful images in Figures 1 and 4 come our way courtesy of Michael Cardwell. The short story behind the images is that Mr. Cardwell found the PICA as shown in Figure 1 crawling blindly about on a back road in Cochise County one April afternoon. When things like this happen, and a nice guy like Mike comes by with wire cutters to free a creature as doomed as

Figure 4. Snake hero Michael Cardwell rescued the Gophersnake seen in Figure 1 with the only tool that he had—wire cutters! He did a fine job with it. Note that there was a small rodent nest inside the can, and also note the defensive posture of the snake. It's probably angry because the filthy varmints drank all of its beer! See text for further details. Image by Michael Cardwell, Cochise County Arizona, April 2009

this snake was, it almost seems to point to a higher power at work. The snake was screwed beyond *all* hope, and was set free by a herpetologist who just happened along? What are the odds? (Cardwell, 2009).

13. Packrats and other PICA foodstuffs

The following event happened at a place we called the Leopard Lizard spot. (Would the reader care to guess why we named the place this?) Said Leopard Lizard spot used to exist less than half a mile east of exit/mile marker 236 on I-10. The place is now a series of tightly-packed, $300,000 homes. I *should* do a column on that place someday, as it was a cornucopia of cool snake *and* lizard behaviors. On 27 June 1992, I saw a packrat (*Neotoma albigula*) scurry into a soil hole that was roughly 100 mm in diameter. Said 100-mm-diameter soil hole tunneled beneath a cholla and stick-infested midden, which was all piled against a steep wash embankment, under the canopy of a creosote bush. The rat was about as big as they get in these parts, which means it was roughly 6 inches long (minus the tail) and approximately 150 grams in mass. As quick as the rat ran into the hole, it came barreling back out. A young of the previous year PICA, perhaps 45 cm (18 inches) long, perhaps 25 grams in mass, was clamped to the rear haunches of the rat by means of its wide-open jowls. In other words, the snake had the rat by the ass. I watched that panic-stricken rat scamper directly between my legs, and continue onward for a distance of about 50 meters. It was lumbering awkwardly away at full ratty-tilt. It was quite the spectacle, as at times, the little Gophersnake was waving about nearly straight out behind the rat—like a tail on a kite. At other times, the wee one was trying to throw a loop around the rat's midsection. But the rat always kept a step ahead of those flailing coils. The observation ended when the rat rounded a bend in the wash. The plucky snake was still trying to throw a coil over the rat as they both disappeared. The whole event lasted less than 15 seconds. It was great fun to watch, but it would have been even *more* fun if that hapless snake had managed to get a loop or two around the rat. These are the type of sightings that I *live for*!

Figure 5. This image was originally lifted off a Facebook post and distributed widely. The origin of the photo is unknown, as is the location, but there is strong evidence that the date it happened was 13 March 2019. Within the framework of the water valve box are three packrats, two *Crotalus atrox* and a Gophersnake. The Gophersnake appears to have helped itself to one of the young packrats. Photographer unknown—*but what a great shot!*

On 10 August 1996, a gang of four of us were herping Summer Canyon, a steep drainage on the west side of Ragged Top. At 0835 hours this morning, we witnessed a different kind of interface between a PICA and a packrat. While the story has already been told in this most hallowed of all publications, my faith is quite strong that none of you remember it. I resort to directly quoting the write-up, and as a result earn the privilege of free advertisement by citing myself (Repp, 2018; p. 213):

> A 1.5-meter-long, lanky Sonoran Gophersnake (*Pituophis catenifer*) was viewed crawling into the entrance of a formidable Packrat mound (also called "Packrat house" or "Packrat midden"). This mound bristled with spiny plants of all manner, intricately woven with sticks, chunks of cowpies, tortoise turds, and anything else that was not sugar, spice and everything nice. We watched that large and hungry Gophersnake cautiously enter the house until it disappeared completely. There next ensued a single loud "squeak," followed by quite a ruckus that outwardly shook the house to its rafters. We looked at each other, and Patti said: "Score one for the Gophersnake." Within seconds of that happening, a hefty mother Packrat came scurrying out of one of the many exit holes. The reason I know that she was a mother is because two young Packrats—each well over half the size of mamma—were clinging to her teats.

Those two events are as close as this author has ever come to actually witnessing feeding events with wild Gophersnakes. I *do* have an interesting "smoking gun" image to share of a PICA with a packrat food bolus (Figure 5). I also have at least five observations from my radio-tracking days of adult Gophersnakes entering packrat houses that either Black-tailed Rattlesnakes (*Crotalus molossus*) or *Crotalus atrox* also occupied.

Figure 6. Death from above! Gophersnakes are *great* climbers, and will not hesitate to go arboreal in search of prey. The PICA in this image is playing "lovey-dovey" in the nest of a dove, who obviously thought the hanging plant a safe haven for nesting. Wrong! Image by Dennis Caldwell.

One image—that I deeply lament losing—was sent to me by my friend and coworker Melissa Bowersock. The lost image was of an adult PICA that had candy-caned its way up a near-vertical dangling extension cord inside of Melissa's carport. While the rear half of the snake clung to the extension cord, the front half was stretched out ramrod straight and horizontal to the cement. It was over six feet in the air. The straight half of this snake was investigating a birdhouse. The snake's snout was roughly an inch away from the entrance to that birdhouse, which contained fledgling Gila Woodpeckers. The image demonstrated an amazing display of strength and acrobatic agility on the part of the snake. But the effort went unrewarded. Melissa fearlessly unwound it from the cord, and took it for a ride in the country. Since Melissa is one of the good guys, it was released unharmed. But she was not enough of a good guy to feed it first! While I missed a good opportunity to include Melissa's image, thanks to Dennis Caldwell we have something similar to share. Refer to Figure 6 and the caption below it. This observation involves an ~4-foot-long PICA (I guess they're *all* ~4 feet long, except when they're not) dangling from the rafter of Caldwell's porch awning while wreaking havoc upon a dove's nest below.

In addition to the previously mentioned images of a Gophersnake eating a round-tailed ground squirrel, an image of one choking down a fledgling white-winged dove out of the nest can also be seen on the website of the Tucson Herpetological Soci-

Figure 7. A Gophersnake eating a bird. Several experts have been consulted, and most agree that the bird in this image is indeed a bird. One, Wendy Paulson, rang in with "Gambel's quail." This diagnosis makes sense, given the fact that the fowl play in this image likely involved two birds. A ground-nesting bird like a quail is certainly a viable option. Image by Dennis Caldwell.

ety (Repp, 2002). While I can't personally add any further prey items to the diet of PICA, I can blindly say that anything with fur that they can overpower and devour is on the menu. There is also no doubt that they relish our feathered friends, and/or their eggs (Figure 7). I have heard that they also eat lizards and other snakes, but have never seen even so much as an image of that, or heard of it happening. In wrapping this section up, I include an image of a PICA with a rather uniquely-shaped food bolus (Figure 8). A gang of six seasoned field herpers has guessed at what the food bolus is, and all six arrived at different answers! Two of those guesses were a Gila Monster and a Desert Iguana! Gee—would a Gophersnake eat a Gila Monster? Beats me, but I know that I will never try feeding one to the other to find out.

14. On predators and potential predators of PICA

All of my personal observations of predation or attempted predation observations (6+ total) on PICA have been birds. The first and most impressive instance of death from above avian predation of PICA that I ever saw was in the form of a golden eagle. The event happened during the late spring of 1981, within two weeks of our small family moving to Tucson. We arrived here on 1 May 1981. While I was not yet keeping any form of herp journal—or even considering that I might one day create one—the golden eagle observation alone would have been enough to burn the memory into my brain. My guess that the observation happened in mid-May of 1981 will have to suffice. I was hiking the Hugh Norris Trail in Saguaro National Park West, when a large shadow drifted across the trail directly in front of me. So perfect was this shadow at replicating reality that I could actually see that it was a large raptor that had a snake in its talons. When I looked upward, I saw that the bird was a golden eagle, and the snake that was being carried away was a large adult Gophersnake. As the eagle was less than 100 feet above me, and sailing slowly along with but an occasional wing flap to stay aloft, I was able to get a magnificent and lingering look at both predator and prey. The eagle had a wingspan of roughly six feet, and the Gophersnake was minimally five feet in total length, with a hefty build. The eagle grasped the snake in both talons, roughly 18 inches distally from the head. The snake was still alive, although its struggles seemed feeble. It was slowly writhing helplessly about. It had to be in a *lot* of pain. The eagle was traveling from east to west as it passed overhead. I was able to watch it pass out of the Tucson Mountains, and continue onward across Avra Valley. It was heading in the direction of Ragged Top when it became a speck in the sky that gradually diminished and vanished. All totaled, I probably had a five-minute view of the spectacle. What a sight! Welcome to Arizona, Repp!

On two occasions, the author has witnessed red-tailed hawks feeding on juvenile Gophersnakes. The two instances were nearly identical in all respects. Both events will be described as if there were two separate hawks involved, but they may have been the same hawk twice. They were observed in the late afternoon, while I attempted to play tennis on the courts of the West Campus of Pima Community College. In both cases, the hawks were perched at the very top of light poles that stood roughly 15 meters proud of the courts. In both cases, the hawks had already dispatched the young Gophersnakes before I noticed them. With both events, the snakes were gripped with the left talon of the hawks involved, while the right talons were used to keep a foothold on the rim of the lights. The snakes were being held by the neck, and in both cases, the head was already miss-

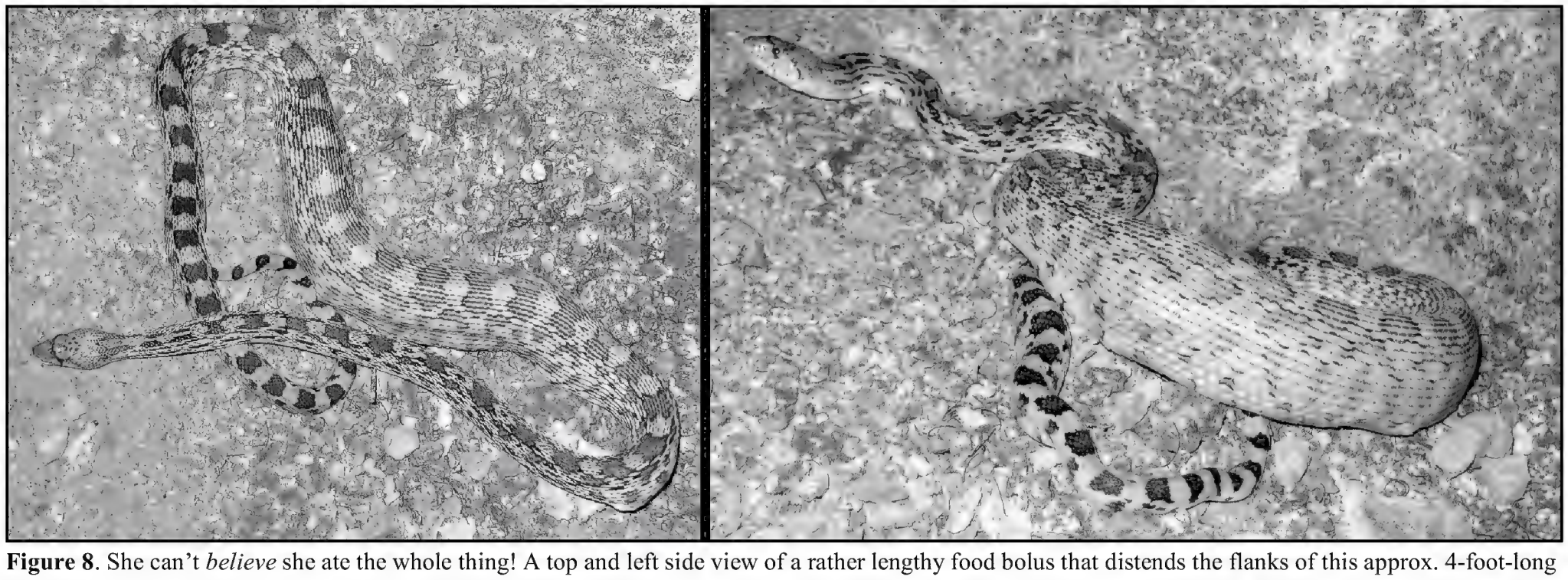


Figure 8. She can't *believe* she ate the whole thing! A top and left side view of a rather lengthy food bolus that distends the flanks of this approx. 4-foot-long PICA. I have distributed these images to a few knowledgeable friends, and the guesses as to what the prey item might be include a Gila Monster! *It could be!* My own guess, probably wishful thinking, is that it is a rock squirrel. Image by the author, 8 August 2007, Saguaro National Park West.

ing when first observed. There was no movement on the part of the snakes involved, which would indicate that they were dead beyond the point where even all reflex motion had stopped. The snakes dangled vertical to the courts, and the hawks were using their beaks to perform the tearing work involved. In other words, the snakes were being devoured in a head-to-tail, straight down fashion. Both events happened before 1990. Hence, I do not have any written documentation of either observation. However, both events must have happened around a June time frame, as we faithfully started our matches at 1730 hours, and it was still daylight when we finished. In both cases, the hawks were still working on eating their supper as we left.

I am pleased to report that I have actual dates, herp journal entries, and witnesses for the next two observations. The first was a predation attempt of a young-of-the-year Gophersnake by a roadrunner. The incident, which occurred on 11 October 2019, was a quick grab and drop on the part of the bird. The roadrunner was a flyin', runnin' and gunnin' fool, and so was I. As much as I hate citing myself, the importance of getting this sort of observation in the public eye as much as possible is important enough to do so. The whole story can be found in a recent issue of this publication (Repp, 2020).

On 30 June 2020, René Clark and I were privileged to find four gray hawks—likely a family unit—all noisily hanging out in a small grove of oak and cottonwood trees in a canyon at the eastern base of the Rincon Mountains. At first, there were three gray hawks within sight and earshot of us, and we had great fun stalking them, and getting great looks at each of them. One appeared larger than the other two. At ~1030 hours, a fourth gray hawk—a larger one—flew directly overhead, with a roughly 30-cm-long PICA in its beak. It landed near the top of one of the tallest cottonwoods, and was immediately joined by one of the smaller hawks. Said smaller hawk tried to take the snake away, but the larger wasn't letting go. Both birds then hopped out of sight into the densest nearby canopy, and the other two joined them. The spoilsports all got quiet, and remained out of sight. I suspect that their nest was located somewhere in that canopy.

Lastly, where avian predators are concerned, ravens *might* be taking down prodigious numbers of the younger PICA. My normal visual of this happening is a raven landing on a paved road 50 or so meters ahead of me, snagging a small snake, and flying away with it before I can positively identify the snake. In all cases, I can see enough to know that the prey item is not a rattlesnake, but that's *all* I can say about any of them. (Except that it is *mighty* frustrating to have a frigging introduced species of bird—that is nevertheless strictly protected by migratory bird laws—snagging prizes out from under my nose.) This sort of event has been observed at least ten times through the years, and the law of averages would dictate that one or more of these frustrating encounters would have to have been a PICA.

As for other critters that will eat Gophersnakes, this author will simply fire off a "no doubter" list. The reader must keep in mind that when speaking of Gophersnakes, and what might eat them, we speak of a snake that can range in size from ~300 mm (12 inches) to over 2,134 mm (seven feet) long. This allows for a potentially varied predator base, from small to large. We will largely ignore insects and arthropods, although ants, black widow spiders, and desert hairy scorpions would certainly be a danger to a young PICA. As already suggested, birds of prey are all suspect. I have seen a loggerhead shrike fly off with a 300 mm long Patch-nosed Snake (*Salvadora hexalepis*) in its beak. There would be very little size difference between the *Salvadora* just described and a hatchling Gophersnake. I have also learned to clear out of any valley when a rafter of turkeys is viewed foraging ahead of me. They are better herpers than I am, and will not hesitate to choke down any snake that they can. It is downright exasperating to know that Arizona Game and Fish continues to reintroduce them into places where they previously had the good graces to disappear from. And they reintroduce them with great fanfare—as if they are doing the world a favor! Moving along to furry creatures, there is no doubt that ground squirrels kill and eat young PICA, and a rock squirrel has been documented harassing a young Arizona Black Rattlesnake (*Crotalus cerberus*)—as well as their mother "Sigma" at an aggregate den near Prescott, Arizona (Amarello and Smith, 2011). If a squirrel poses a threat to a rattlesnake, it is probable that one would pose an even greater threat to a young Gophersnake. Grasshopper mice and shrews would also be suspect. The Tucson region is blessed to have four species of skunk. All four—the spotted, hognose, hooded and striped—would no doubt devour a young PICA. Moving up in the ranks of the rank, domestic cats and dogs, raccoons, coatis, ringtails, foxes, badgers, coyotes, bobcats, mountain lions, and the rarer cats like jaguars and ocelots would also take one down.

As for humans, what can we say about them? The 346 PICA that the author found DOR through the years certainly points to the abysmal slaughter on our roads. But Arizona is actually one of the most tolerant states of all when it comes to the wanton killing of snakes on sight. It would take more than the fingers of both hands to count the number of times I have observed automobiles swerving to *avoid* hitting one on the road. And I have never seen anybody go out of their lane to hit one. I am convinced that most DORs—snakes or otherwise—happen simply because drivers are not watching the roads closely enough to even notice them. That is especially true at night. I have read that people tend to kill PICA because of their superficial resemblance to rattlesnakes (Stebbins, 1985). I have zero evidence to support that locally, but it probably happens more than it should. As for hunters killing a PICA as a potential meal, my association with hunters through the years assures that if that were commonplace, I would know about it. On the other hand, *Crotalus atrox* are routinely killed and devoured by the local hunters.

15. Stuck up Gophersnake, or, there is no such thing as a free lunch in nature

My field notes have this to say about the following observation: *11-12-00 Drove to Rene Muhlberg's house to photo dead Gophersnake in branches of chain fruit cholla. Old dove nest in branches ~1 meter away, slightly above snake. Perhaps two months dead? Rene lives on Old West Road, 1 mile west of Sandario and Manville Road.* As the images in Figure 9 indicate, this was not a pretty death. To say that the snake overestimated its ability to climb the beastly plant would be an understatement. What was not included in the notes is that this PICA

Figure 9. (Left) An estimated four-foot-long dead Gophersnake as found nearly six feet above the ground in the brutal embrace of a wicked chain fruit cholla cactus. The top arrow points to the head, and the lower arrow indicates the tail. (Right) Close up of the impaled and nearly severed head of the PICA to the left. There was a bird nest in the branches above the snake. The author speculates that this snake overestimated its ability to climb after prey that was in the nest, and got hung out to dry. See text for details. Image by the author, 12 November 2000.

was roughly four feet long, and the head was severed from the body at the neck. Also not included was how far up that PICA got before the cholla embraced it. The head was at my eye level, or roughly five feet, nine inches above ground. The head being separated from the body is difficult to explain. The inclusion of the dove nest in my notes certainly explains the snake's motive for its perilous climb. However, I must say that it could have been the nest of *any* type of bird larger than a sparrow. My knowledge of nest forms is even less than my knowledge of the birds who use them. In any case, this nest probably became a beacon of death for this unfortunate snake. While we were scanning my 35mm slides of this event, Dennis Caldwell suggested the possibility of a predator somehow placing the snake there. This might explain the partially severed head. I can't dismiss any reasonable explanation for what happened here. But having seen two other species of snake effortlessly glide up a cholla unharmed, as well as the presence of the bird nest in this observation, has me leaning toward my own hypothesis.

16. On hissing

While in an email discussion on Gophersnakes with a group of friends, Michael Comroe emailed me a video of one that was hissing so prolifically that I sent the video far and wide for others to see. In it the PICA, an average-looking, roughly four-foot-long individual, is seen to noisily inflate with each inhale, and noisily deflate with each exhale. I was just about to write that the action is much like smoking a joint, except that there isn't any coughing during the smooth exhale. My wife Dianna entered my study as I was watching this video and, upon looking over my shoulder and listening, suggested that the action was similar to yoga breathing exercises. This is a *much* better analogy. Breathe in deeply (f-o-o-o-o-s-h-h-h-h), breathe out (f-i-s-s-s-s-s-h-h-h-h).

It is nearly *killing me* to stay true to my mission of discussing *only* Gophersnakes from Arizona in this column, as some *great* comments about hissing crossed my screen from the folk who keep their close cousins, the Bullsnakes and Pinesnakes. I should add that our local PICA are less liable to hiss than the *Pituophis* clade from back east. *Crotalus atrox* are *much* more inclined to hiss than our PICA, and their vocalizations are more consistently heard here. They are also louder and more sustained in duration.

17. On longevity, growth rates and sexual maturity

On the evening of 5 September 1996, at 1928 hours, I was with Allison Titcomb when she snagged a hatchling PICA off the frontage road near I-10 and Marana. She collected this snake because she wanted a Gophersnake to use for the educational programs of the THS. She named the snake Bruno, and true to her word, Bruno was introduced to thousands of grammar school children. When we ascertained that Bruno was female, her name remained Bruno. Allison eventually decided she no longer wanted to do these programs, and in 2003 handed Bruno off to Ed Moll. It is interesting to note that Bruno was about 1 meter (39.38 inches) long when Dr. Moll received her. Ed used Bruno until he resigned from his THS public outreach duties in early 2017, and gave all of his program herps away. All efforts to discover what happened to Bruno after Ed relinquished her have been a bust. Hence, I meekly report 20+ years as my personally-known longevity record for PICA. It is interesting to note that Bruno was roughly four feet long (~1.2 m) when Ed found Bruno her new home. This wildly conflicts with something that Phil Rosen told me about having one individual from his Organ Pipe Cactus National Park study grow from hatchling to over four feet long in one year! If we believe Phil (and I do), we can say that they *can* grow quickly. We can also use Bruno to indicate that growth of close to 1 meter in a year isn't universally true. As for sexual maturity, I am going to guess that a female PICA could not reproduce until it is at least one meter snout–vent length. Here is the chance for the fine folk who

wrote the Gophersnake account for *Snakes of Arizona* to shine, and enlighten us all!

18: Reproduction and reproductive behavior for PICA in Arizona

During the information-gathering phase of this section is when all notions of the "Tucson Four" went right out the window. To be sure, Don Swann and Jim Rorabaugh have contributed valuable information, and I will get a few licks in as well. The fact that Marty Feldner had little to offer on wild reproduction was sobering, as he is usually the best repository of information about wild herp behavior in all of Arizona. But once I saw that this wasn't going to be easy, I pulled out all the stops. I conducted many web searches well beyond the THS Website, emailed some colleagues and (gasp!) cracked open some books as well. The one book that I will *not* crack open until all input is in this column will be the Gophersnake account in *Snakes of Arizona*. I can only hope that Babb et al. (2020) fared better on the reproductive front.

A field-wise Arizona herpetologist once told me "If you haven't seen reproduction with wild Gila Monsters, you don't know *shit*." While I found the statement somewhat harsh (not to mention offensive), there *is* some truth in it. How can one be an expert on the behavior of any given animal without knowledge of reproduction in its wild state? Up until the year 2007, *nobody* had ever seen Gila Monsters mating in the wild, and it was not until 2016 that a glimmer of when their eggs hatch was documented. By the way, the guy who issued this "you don't know shit" statement had also likely *never* seen either mating *or* nesting in the wild, unless we count the observations that came out of his mouth. Like so many people of our ilk, if bullshit were electricity, this dude would be a dynamo! Gila Monsters lead a largely subterranean existence. Even when radio-tracking them, visuals are rare. It's like tracking Russian submarines. One might know where they are. One might know when two (or more) have paired up, and are *probably* mating. One might even know when and where a female oviposited. But if you can't physically see any of that, you don't know sh . . . er uh . . . much.

I am now shifting gears away from radio-tracking Gila Monsters to get back on course with Gophersnakes. The only person I knew to ever radio-track a PICA in Arizona was David L. Hardy, Sr. He claimed to have radio-tracked one individual at some point many years before I knew him (Dave Hardy, pers. comm.) When I was considering adding PICA to our Suizo Mountain radio-telemetry study, knowing that Dave had radio-tracked one previously, I asked his advice. His response was "Why would you want to radio-track a snake that you will never see?" That response was enough to stop any notion of me radio-tracking them. I was already tracking Gila Monsters, and didn't need any more of this writing up patches of ground—without the benefit of seeing my quarry—type of stuff.

I must confess that this "you don't know shit" statement had me extremely rattled during the early going of writing this section on reproduction. It *is* an accurate statement. Truth be told, I will be agitated to my dying day with two very important observations about local PICA reproduction that must fall by the wayside due to unresponsive herpetologists. But I have managed to calm myself down enough to continue to have fun with the remainder of this column. (*I am going to have fun with this column if it* ***kills me!***) If I have learned anything at all from the intensive effort of trying to gather information on the subject of mating PICA in Arizona, it is that such observations are rare. It appears that neither Mother Nature nor our most common colubrid is prone to kiss and tell.

Armed with the "Somewhat Haphazard Information Transfer" (also known as "SHIT") that I *do* have, I will boldly say that I see nothing that indicates anything but a spring/foresummer mating time period for reproduction with the ten PICA reproductive events discussed below. Foresummer is a word used to describe the hot and dry period between mid-May and the arrival of the first summer rains—typically mid-July. And while double-clutching might occur commonly among the breeders of *Pituophis*, it would take some *extremely* rare weather circumstances to have it happen in the wild here. The reader should know that I pray *every day* for such a rare weather circumstance to occur. Our 2020 pandemic shook humanity to its rafters, but in my eyes, the horror and misery of our virus took a back seat to the relentless drought here in Southern Arizona. It is a drought that continues to this very day.

So, which came first, the Gophersnake, or the egg? In this column, it will be the egg. In the 1990s, for several consecutive years, I visited the fifth grade class of Ms. Kendal St. Johns. I taught her class about the reptiles who earned their living close to Tucson. Kendal kept a pair of Gophersnakes that were wild-caught near her house in the southern Tortolita Mountains. At the time, that portion of the Tortolitas was wild and remote. That is no longer the situation. Kendal's PICA pair bred for her every year. She was an able keeper, who took immaculate care of her charges. At the time I saw them, Rufus (the male) and Tugball (the female) were over five feet long. They were both *dandies*! Kendal was capable with the captive-breeding aspects of her captive PICA, and consistently took Tugball's eggs all the way through to hatching. In the summer of 1995, Kendal was able to take a well-deserved vacation. She entrusted the care of Tugball's eggs to me. She told me that the pair bred in "late April," and that Tugball "oviposited in mid-June." I did not question her any further on the matter. Ten of the 12 eggs pipped on 18 August, and two young entered our world on 19 August (Figure 10). The remaining two eggs were infertile. All of this jibes with a "2–24

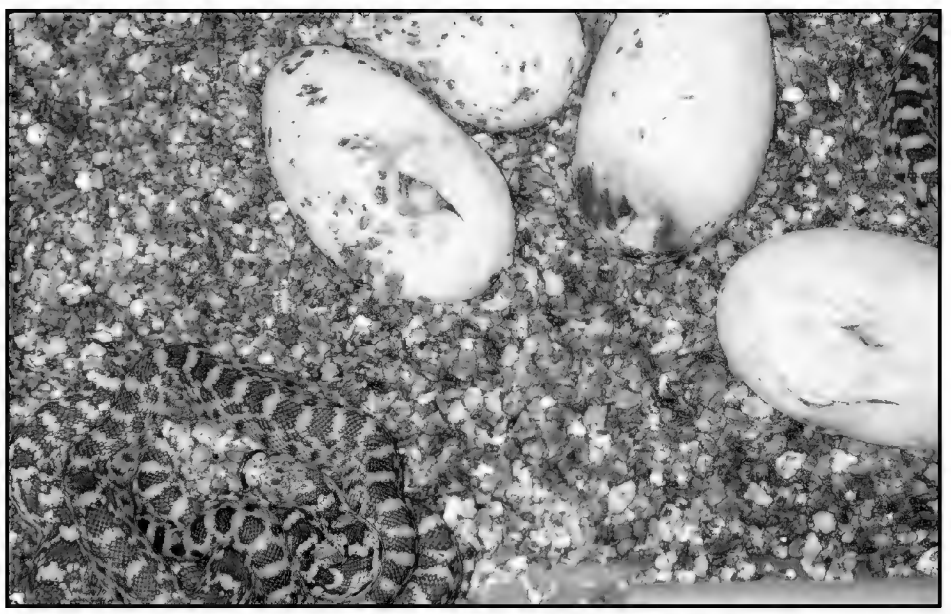


Figure 10. The progeny of a wild-caught pair of Gophersnakes photographed in the midst of pipping and hatching. See text for details. Image by the author, 19 August 1995.

eggs, laid June–August" scenario (Stebbins, 1985). The timing of this hatching jibes with when the bulk of the young PICA appear in full force on the landscape under my watch. Most of what I do involves a nearly identical situation to the 2,000 to 3,600 feet elevational range of the Tortolitas. Roughly 80% of my herping is within 30 miles of where Rufus and Tugball once roamed.

Gradually shifting into the on-the-ground occurrences of pairings, combat, courtship and potential for mating to occur, we go for my personal observations first. I have observed near-pairings of PICA twice. The first was described in Section 1 of Part 1. Briefly reviewing this observation, on 1 May 2004, an adult sexual pair was found within 20 feet of each other. This near-pairing occurred on our Suizo Mountain Study Plot, which is 40 miles north of Tucson. The elevation was 2,700 feet, and the two PICA were found at approximately 1100 hours. My second near-pairing was on 6 June, 2016. It occurred on Fort Grant Road, perhaps five miles north of Willcox, Arizona, at approximately 1715 hrs. I was accompanied by Marty Feldner and Patti Mahaney. I was driving, we were northbound, and in a hurry to do something far less important. The elevation there is 4,200 feet, and the terrain is flat grasslands. From a distance of about 100 meters away, we saw a large (approx. 1.6 meters total length) PICA writhing about in the final throes of death. This grisly sight was being observed to our far left, on the west edge of the southbound lane. It had very recently become a DOR PICA. I was in the process of slowing down for a look at that one, when we saw another PICA, this one approx. 1.2 meters total length, begin to enter our northbound lane. It was on the exact same trajectory as the first. It was likely in pursuit of the now-dead one. There was traffic behind me, and there was traffic coming at us. I cranked down my window, and thrust my left arm out and downward to let those behind me know we were stopping. (There also may have been red brake lights involved—but who knows if they actually work? I'm always in the front seat when they *hopefully* earn their keep.) When I pulled half-way off the road and stopped, the live PICA was already on the pavement, directly in front of the truck. Being the *excellent* shotgun-seat herper that he is, Marty was out the door, and Patti was not far behind. (Yes, "herper's chivalry" was alive and well this day, as Patti was relegated to the back seat.) They of course left both their doors wide open as they egressed from the vehicle, as is the wont of hasty herpers. Marty tailed the snake, and moved it well away from the road. I was then able to pull over and get safely off the road and onto the wide shoulder. Those vehicles behind me showed their appreciation for all that had just happened in front of them with a 21-horn salute as they passed by. There were an equal amount of one-fingered salutes to accompany the blaring horns. Apparently, the folk who live around Willcox are a rude and ill-tempered lot.

It was at this point that the human part of this observation happened out of sequence. What *should have* happened is that one of us should have moved the live snake about 20 meters off the road, while another should have retrieved the dead one, and brought it to the live one. We should have then placed the dead one on the ground, and encouraged the live one to get a whiff of the dead one's naughty bits. That would *surely* have been enough to produce a horny hormonal peak in the male. We could have then photographed the PICA necrophilia that would have followed, and ***EYE*** would have the PICA mating observation of the century to share in this column! But no, the chance to become heroes came and went when we moved the live snake—which *was* a male—about 100 meters off the road. When we put him down, he insisted on heading back toward the road. We insisted harder that returning to the road was a very bad idea. In the end, well-aimed kicks directed fast-moving pebbles and sticks to cascade horizontally upon him. There were also lots of arm waving and bellicose, vulgar taunts involved. Eventually, we imposed our will upon him, and he reluctantly crawled off. Then, and *only* then, did a quick powwow ensue. All three of us understand the mentality of a creature with two peckers, no hands, and raging testosterone. Unless we stood guard 24/7 for the next week or so, our boy was *surely* going to return to that road. We don't want any of this Romeo and Juliet stuff in *our* house! We decided to peel the DOR PICA—which *was* a female—off the road and bring it back to our boy. The only problem was that we could not find him! We left his potential mate in what was hopefully an obvious spot for him to find, and moved on.

At this point I interject that these two incidents are the *only* times I have that I have witnessed a pair of Gophersnakes in close proximity to each other. As Figure 3 suggests, I have entered the field 3,592 times during the 26-point-five-year time period under discussion. To only be able to report two pairings—which are not exactly even pairings—with all that effort clearly demonstrates how difficult any form of PICA reproduction can be to witness. Those who *have* seen it are indeed fortunate. And lucky too!

Without getting overly long-winded about what constitutes a reproductive event with any species of snake, I will simply say that I consider combat to be a good indicator of the seasonality of snake reproduction. For example, as one who has more than a basic knowledge of the reproductive aspects of *Crotalus atrox*, I can say with a high degree of authority that *never* do they fight during anything but the breeding seasons. For them, that is March to end of April, and again in September to mid-October. You will *not* see them fight during any other time period. Courtship is even more definitive than combat as an indicator that mating season has arrived. Courtship does not *always* lead to mating, but it can and often does.

Having said all that, our next observation is definitively combat. Only the totally ignorant would look at the images in Figure 11 and call it mating. The same can be said of rattlesnake combat, which is often mistaken for foreplay between the sexes. The only real similarity in the fighting styles of PICA and rattlesnakes is the importance of head posturing. Whoever can keep their head on top is the one winning the fight. When Gophersnakes fight, the action is all horizontal. They wrap their bodies like the stripes on a candy cane, and one snake tries to keep its head above the other in the process. When rattlesnakes fight, they go vertical for any head posturing. Another basic difference in combat styles is that Gophersnakes will sometimes bite each other *repeatedly* during the heat of battle, while rattlesnakes do not.

On 17 May 1995, between the hours of 1515 and 1625, Don Swann witnessed and subsequently photographed combat between a pair of equally-sized Gophersnakes. The event occurred

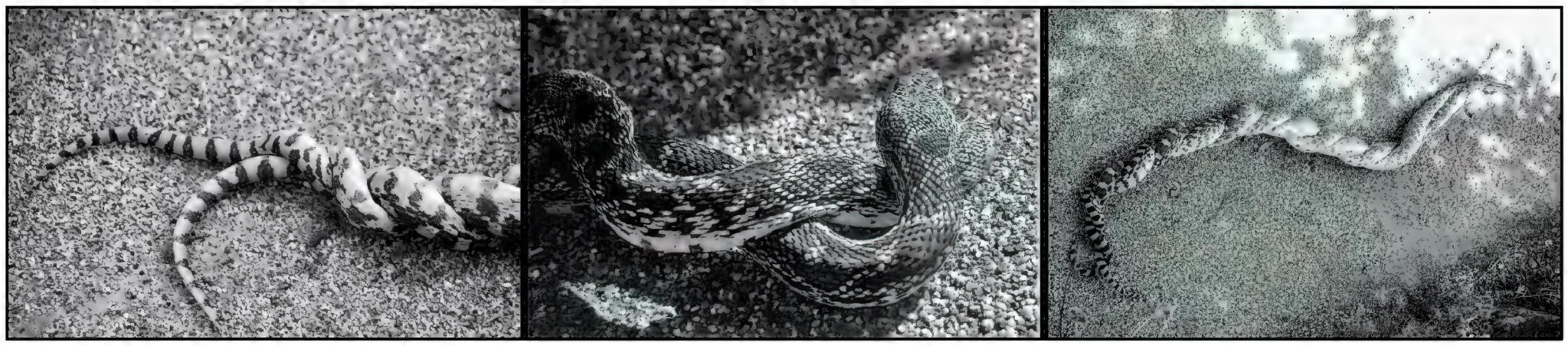


Figure 11. An incident of combat between two adult male Gophersnakes. (Left) The tightly-wound distal half of the snakes anchors both contestants during the shoving-match style of fighting. (Center) Head posturing is an important aspect at determining domination. The snake with his head above the other is winning the fight. (Right) This image shows the ground-hugging, candy-cane wrapping/wrestling style exhibited by the two nearly five-foot-long contestants. See also the text below these images for a beautifully worded account of PICA combat as described by authors Bogert and Roth (1966). Images by Don Swann, 17 May 1995, Gila County, Arizona.

at Tonto National Monument, which is located in Gila County, 70 miles to the east of Phoenix. The elevation at the vicinity of the fight was roughly 2,900 feet. Both snakes were ~150 cm (~5 feet) in total length. Despite the similar size of the contestants, Don's impression during the 70 minutes he observed them was that one snake had a slight advantage over the other. He also witnessed "infrequent biting, occasional head-pressing, and lots of tangling" (Don Swann, pers. comm.) As is often the case with snake combat, the female was not visible.

Moving along to another incident of PICA combat, Harry Greene was kind enough to send along an *outstanding* paper (Bogert and Roth, 1966) on a Gophersnake combat incident that happened near Portal, Arizona. Before proceeding any further, it is unclear to me whether or not "junior author" Vincent Roth was the observer and photographer of the event. The language of the paper only indicates that Mr. Roth "obtained photographs" of the event. In any case, whoever documented the incident did a *fantastic* and *inspiring* job. I am mortified at being the person to paraphrase the magnificence and pure artistry of the descriptive words used in this paper. I will attempt to pick off some of the details of the eloquent writing style *that seems to be lost forever in the papers of today* by quoting small segments of this paper while I slaughter the rest with my intrusions. On page 4, a photograph of the combatants is captioned thusly:

> Male Gophersnakes tend to maintain tails and posterior portions of their bodies entwined while engaged in combat. Anterior portions of their bodies are more often loosely entwined, with heads nearly parallel.

That caption from 1966 could just as well be used for Figure 11 above.

The incident described transpired on 2 May 1964. It happened from 1500 to slightly beyond 1600 hours that day, when the observer was asked to remove the snakes. How long the fight had been occurring before 1500 hours was unknown. The ambient air temperature was 26°C, but as the bout occurred in direct sunlight on open ground, the ground temperature was likely much hotter. I once again quote the observer:

> Even with their bodies intertwined, and despite their inability to employ their normal locomotion, the snakes moved forward slowly, seemingly propelled by the force that each snake exerted on the coils of the other. This "corkscrew" propulsion led the snakes to advance more or less steadily in the same direction.

During the hour plus that the snakes were under observation, they moved forward a distance of 9 meters. I pick up the narrative again:

> The extent of the interlacing of bodies and tails varied from time to time, but the snakes were continuously intertwined throughout the period of observation. At times both snakes had the anterior portions of their bodies free. On such occasions one head was momentarily separated from the other when each snake crooked the free portion of its trunk outward from the main axis of the entwined bodies. At other times one snake elevated the trunk behind its head while the other extended a fold laterally. Ordinarily, however, the heads of both snakes were oriented in the same direction, regardless of whether the head of one or both snakes was elevated or pressed to the substratum. Despite the interlacing of their bodies, each snake attempted to maintain its head and body upright. Occasionally one snake exerted enough pressure on its opponent to force it to tilt its head, or the entwined bodies of both snakes rolled completely over. Both snakes rolled over together only when one snake managed to press a lateral fold to the substratum while the anterior part of the other snake extended along the axis of the tightly entwined bodies behind it. The snakes quickly regained upright positions after rolling over, and they continued to exert pressure on each other as their entwined bodies advanced.
>
> Throughout the struggle both snakes hissed repeatedly. The volume of sound thus produced was doubtless enhanced by the modifications of the epiglottis characteristic of snakes of the genus. Perhaps respiratory movements were accelerated as a result of muscular exertion as well as by the heat gained from their exposure to solar radiation. The sounds resulting from the forcible expulsion of air may have been little more than a by-product of respiratory cooling, although the normal defensive behavior of large gopher snakes commonly includes loud hissing.

Hissing as a "byproduct of respiratory cooling"? Whether true or not, the notion demonstrates deep thinking on the part of the authors. The whole paper is indicative of the authors trying to stuff ten pounds of fertilizer into a 2-pound bag. The observer also mentions that there was no biting between the participants. In wrapping this exquisitely written paper up, both snakes were huge—in excess of two meters long. They were delivered to the Arizona Sonora Desert Museum, where they were definitively established as being males. The paper goes on to describe the fighting styles of many different snakes, from ratsnakes and kingsnakes to European adders to Australian elapids to mambas in Africa—and a wide variety of others. So good was this masterpiece that I am seriously daunted to carry on! Heretofore, I thought I was a good writer. I shall be more guarded with that opinion in the future.

Our next observation might be combat, but I lean toward

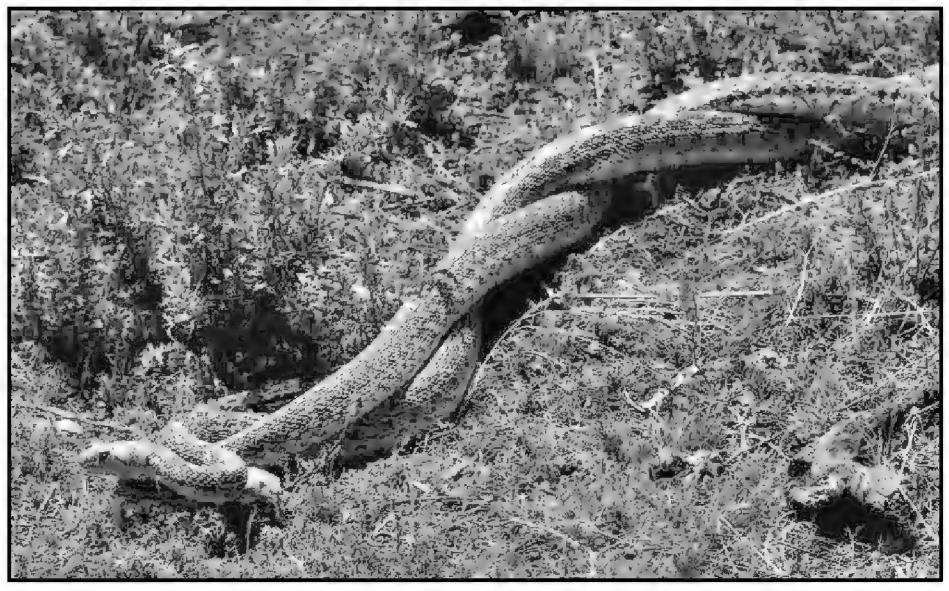


Figure 12. Is this combat, courtship, or mating? One can't distinguish from the image, but the written account of this observation in the text nearby points to courtship. The snake on top is roughly a foot longer, the head is larger, and the body wraps are loose and relaxed. That all indicates this to be a sexual pair, who are trying to make love—*not* war. Image by Jim Rorabaugh, 2 June 1984, Santa Cruz County, Arizona.

courtship based on the lone photograph shown and written account of observer Jim Rorabaugh (Figure 12). On 2 June 1984, Jim was hiking in the Atascosa Mountains, which are located in Santa Cruz County, just north of the Mexican border. The elevation in that area is 3,650 feet. He is guessing the time to be midday. A large (four feet plus in total length) PICA shot across the trail directly in front of him. As he paused to watch this snake, another that was roughly one foot longer also passed before him—right on the tail of the first. The pair "twined up" in an opening roughly ten feet from him, but they seemed to have some difficulty with tail alignment. They did not copulate, but appeared to be trying. Jim speculates that they were getting hot in the direct sunlight in the clearing where they had paused, since one of them—the smaller snake—shot under some bushes and into a Packrat nest. The other snake followed, at which point a Packrat was viewed beating a hasty egress from the nest. After that, Jim did not see the snakes again. The whole observation lasted about ten minutes (Jim Rorabaugh, pers. comm.)

The next image/observation to be discussed is included despite my not knowing where it happened or exactly when it happened (Figure 13). I am 90% certain the event happened in May of 2007, and 99% certain that the image depicts courtship

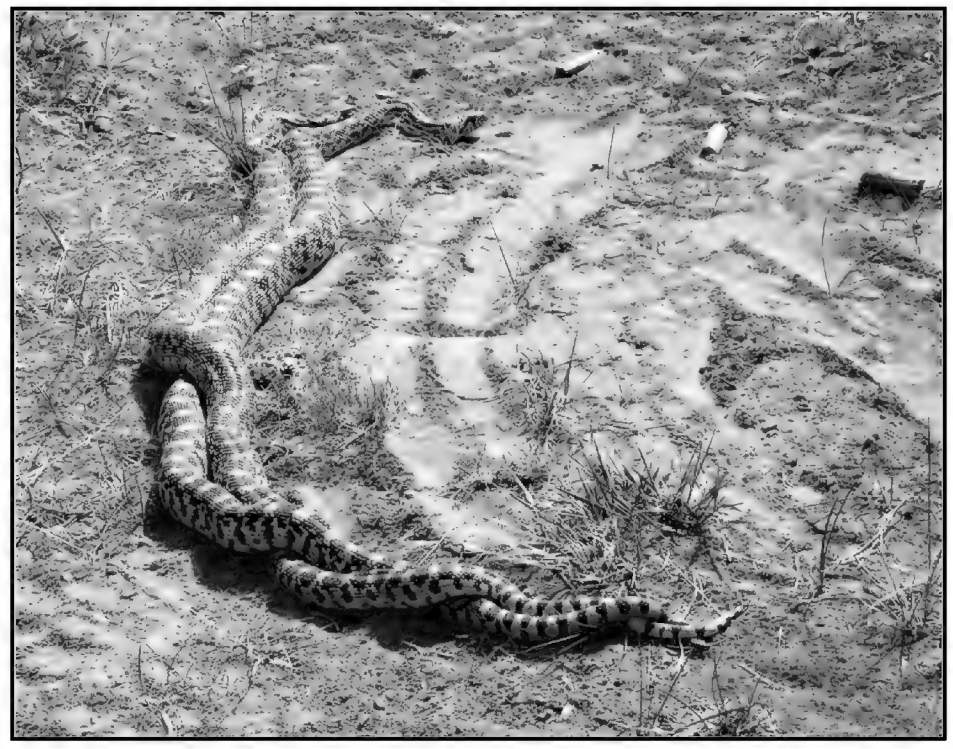


Figure 13. The author confesses that all details relating to this image are unclear. It is included simply because it is a terrific image of what is likely courtship. Compare what the tails are doing with Figure 14 below. Evidence points to the photographer being Eric Rogan, and the possible date of occurrence as May 2007. The location where the event took place is unknown. The only way the author can ever discover the details behind the photo is to show it everywhere that he possibly can. Eric Rogan—come forth!

and *not* combat. The tail alignment (nearly straight, *not* wrapped), body posturing, and parallel tracks in the sand (no signs of a rollover), all seem to indicate courtship. Indeed, it is my opinion that this image depicts courtship to the point where intromission is imminent. The personal facts behind the image are that I was putting together my very first-ever PowerPoint presentation for an early June presentation to Southwest PARC (Partners in Amphibian and Reptile Conservation). At the last possible instant, this image came to me unsolicited via an email from a long-forgotten source, and I immediately sucked it into my presentation, crediting one Eric Rogan in the process. I have spent the last 14 years seeking more information on this image, with zero luck. Be it combat *or* courtship, I hope the reader will agree that it is most lovely image, and a worthy inclusion herein. My biggest issue with sharing this image is that it may not have happened in Arizona. The two cigarette butts in the image lead me to believe this happened someplace close to human habitation. I also believe that our Eric Rogan is *not* a herpetologist. If

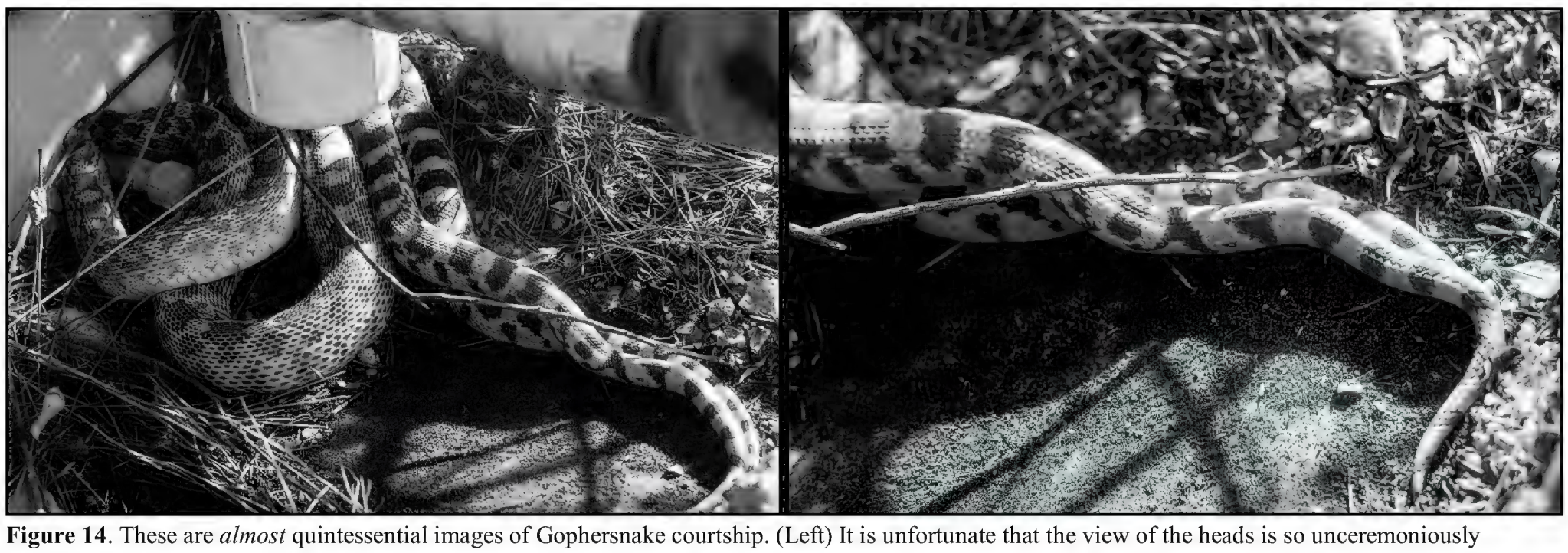


Figure 14. These are *almost* quintessential images of Gophersnake courtship. (Left) It is unfortunate that the view of the heads is so unceremoniously blocked by the pipes, but everything else in this image is five-star. Note that the bodies are at rest, and the tail action is leisurely and calm. (Right) Close-up of the tails. Images by Dennis Caldwell. The location is a semi-urban area in north-central Tucson, and the date the event happened will *forever* be in dispute.

he were "one of the few, the proud, the herp geeks," my far-flung inquiries would *surely* have pinpointed the dude.

The next image and observation occurred at some point between May and mid-July of 1995—depending on who the reader believes. The images in Figure 14 were taken in the back yard of Dennis Caldwell. I saw these images shortly after Dennis had them in hand, nearly 25 years ago. He showed me one of the three 35 mm slides of the event, and my firm, non-negotiable recollection is that he told me "May" as the time it happened. The date on the slide is stamped 20 July 1995. Dennis believes with nearly equal fervor to my own "May" proclamation that the event happened in July. The ensuing squabble will probably endure for the rest of our lives. Only one of us is correct, so I will compromise. It happened in May! Okay, I'll lighten up and say we know it happened sometime between when Dennis was born and 20 July 1995. At the time, Dennis was living just south of the intersection of Sunrise Drive and Craycroft Road, in extreme north-central Tucson. This is the same vicinity from which came the first very large PICA described in Part 1 of this column. The area is roughly 2,800 feet in elevation. The photos are *great* in and of themselves, and no further discourse is needed.

The last two observations are so similar, and so excellent, that we finish the column strong by ending it with them. Number one of two involves two interesting images of PICA courtship, combat, claims of the snakes mating, and a lover's triangle. The images clearly show that photographer Mark Christian was able to witness and photograph something fantastic behavior-wise. But "Mr. Christian" should be keelhauled for not including what is happening with the hind portions of the snakes involved. The images are on a website that indicates the images are for sale, but one can only *purchase* those particular images from that website. It ain't like one can get the whole story by shelling out the money! If either image showed what the tails were doing, I'd already have both—even if I had to sell my house to purchase them! Our photo editor Steve Barten and I exhausted every option to reach Mr. Christian, but he must still be busily swabbing the poop deck of the last herper that he annoyed. Image #1 is the anterior portions of two PICA, one on top of the other. They are laid out fairly straight in orientation. The title of this image is "Gophersnakes Mating." Image #2 is of what I presume to be the same pair as viewed in #1, only with a third Gophersnake smack dab in the middle of them, biting one of the two. (Males will also bite females, or vice versa, during the courtship phase of mating.) The title of that one is "Jealous Boyfriend." The titles of both should include "…and one *pissed off* herper." The good thing to come from whatever waste of time that these images created is that the description for each includes location and a rough date. Both images were photographed at Catalina State Park, in May of 2015. Catalina State Park is roughly ten miles north of the dead center of Tucson, and the chip-sealed road surrounding the snakes in both photos indicate that the event happened somewhere close to the entrance of the park, which is roughly 3,000 feet in elevation. The website that includes these photos can be found at: <https://www.dreamstime.com/photos-images/gopher-snake.html?pg=2>

We have saved the best of *everything* for last. Our final observation took place in Northern Arizona, but despite the "Near Tucson" in the title of this column, it's too good to leave out. It comes from Jeff Smith and Melissa Amarello, the founders of a nonprofit group called "Advocates for Snake Preservation" (ASP). Since their combined efforts are as one force, I will call them "Team ASP" throughout the remainder of this observation. Everything that follows with their wacky and over-the-top observation is on the ASP website in video format (Smith and Amarello, 2011a, b). The fact that an easily accessible video is available allows me to be brief in my account of their account. The multi-faceted event happened on 29 May 2011. It occurred in House Rock Canyon, roughly 20 miles east of the entrance to state route 67, which is the highway that leads to the North Rim of the Grand Canyon. The observations occurred at an elevation of 6,000 feet. As in the observation above, there are three snakes involved—two males and one female. Team ASP named these Gophersnakes after the three protagonists in the Popeye cartoons. "Bluto" is the bully of the story, although Popeye isn't exactly an angel. As in the cartoon, Olive Oyl appears to be smitten with Popeye, and wants nothing to do with Bluto. (I have also observed this sort of behavior with female *Crotalus atrox.* The ladies seem to prefer the younger "pretty boy" males over the larger, stronger males.) For me to go into a blow-by-blow written account would add a lot of words to this piece, and we already have enough of those! All totaled, Team ASP appears to have spent around three hours with these snakes. The video shows lots of circuitous stalking and chasing behaviors on the part of both males. It is clear there are a lot of pheromones involved, but the non-stop, blustery wind seems to wreak havoc with the olfactory functions of our two boys. At one point, Bluto is even seen going arboreal in a pine tree while seeking Olive Oyl. Popeye is viewed biting Olive Oyl on several occasions. What a pair of assholes the two males are in this video! Bluto delivers a complete, prolonged and thorough ass-kicking to Popeye on several different occasions throughout the video. Let that be a lesson to any snake who mistreats his women! Popeye suffers bites from one end of his body to the other from Bluto, but refuses to fight back. That sorry-ass Popeye must have forgotten to eat his spinach on this day (Figure 15). Through this video, we learn that the combat described above can *not* occur if both contestants do not want to fight. The more tender moments of the film show some tail searching, with Popeye's tail on top

Figure 15. A slightly larger male Gophersnake bites a male rival during a lover's-triangle dispute in Northern Arizona. At no point did "ritualistic combat" ensue between these two snakes. The smaller snake was only interested in escape. See text for details. Image courtesy of Advocates for Snake Preservation, 29 May 2011.

Figure 16. The smaller male, shown taking a beating in Figure 15, finally gets his lover alone. Chin rubs were part of the foreplay involved with this couple. See text for details. Image courtesy of Advocates for Snake Preservation, 29 May 2011.

of Olive Oyl's tail. Olive Oyl at times waves him off, while at other times, seems close to yielding. Popeye is also viewed helping himself to some felonious rub-offs by smearing his cloaca along the tail and posterior portions of Olive Oyl. There is also a great deal of chin rubbing going on (Figure 16). There can be little doubt that mating would have occurred if Bluto had not inserted himself—several times—in a most pugnacious manner into the fray. He acts like a jerk throughout! But in the end, your romance author here speculates that Popeye eventually scored. Love *always* triumphs! Love *always* finds a way! For me to say too much more defeats the purpose of the video that Team ASP has so creatively produced. Simply type the link below into your favorite search engine, and it should all pop up for you. Once you finish viewing this first video in its entirety, you can click the link at the end of it that indicates "to be continued . . . " That leads you into the second half of the video. And hey, while you're at it, please consider donating to ASP. Their stated motto is "For the Snakes," and everything they do centers on exactly that. The link: <https://www.snakes.ngo/menage-a-trois-part-1/>

Now, why do I know damn well that you guys won't check out that video? *Because I didn't tell you the best part yet*! At one point, Popeye has his lady under some snakeweed, but the tails are hanging out in the open. We can see that mating is about to occur. The pair is so hot that you can actually see a layer of K-Y ooze forming between the two cloacas. A wet and sloppy Astroglide penetration is about to happen when Bluto bursts upon the scene. He is staring at—but not actually seeing—those two slippery tails roughly two meters dead ahead of his rapidly flicking tongue. Suddenly, a gust of wind blows over those tails, carrying the stink directly into Bluto's face. He picks off a *generous* and sensuous whiff of "eau-de-coitus" with that highly-sensitive tongue of his. He jets straight forward, his head zeroed in on the sweet spot where the yummiest smell is emanating from. He closes the distance quickly, opens wide, and chomps down dead center on the private parts of both snakes. The jerk scores a direct hit. His mouth engulfs the tender bits of both snakes, and he clamps down—hard! That's right, he bites his way directly into the middle of an F-U-Know what! If that is not the epitome of rude and unacceptable behavior, then I don't know what is. Happy viewing!

In wrapping up our collective reproductive observations, it must first be woefully admitted that only the first involved mating. And that is admittedly a nebulous observation at best. (We speak of the late April 1995 captive mating event between Rufus and Tugball.) When I add up our observations, we have reached a total of ten. If we list these observations by the months of occurrence, we see a pattern. That pattern is: one in late April, seven in May (one of which is in dispute as possibly being July—yeah, *right*!), and two in early June. While there was not time to completely and thoroughly document *when* the hatchlings first start to appear on the landscape, those data exist in my herp journals. For now, I'm saying that late July will be the earliest that hatchlings start to become visible, with an overwhelming onslaught appearing in August and September. It is probable that sperm storage is a factor in PICA reproduction, but I have thus far found nothing to indicate that as a fact. With *great* anticipation, I will soon begin my review of the Gophersnake account in the book *Snakes of Arizona.* I expect that if ever the *Snakes of Arizona* publishes a second edition, the Gophersnake account will change somewhat, and grow stronger with the inclusion of some observations of the Southern Arizona herpers.

Until we meet again in this most hallowed of all publications, this here is Roger Repp, signing off from Southern Arizona, where the turtles are strong, the snakes are handsome, and the lizards are above average.

Acknowledgments

First and foremost, the author is grateful to Marty Feldner, Jim Rorabaugh, and Don Swann (the non-Repp members of the "Tucson Four") for their insights and patient responses to my many questions. I am also indebted to Jeff Smith and Melissa Amarello of Advocates for Snake Preservation for their videos, images, and correspondence concerning their unique Northern Arizona PICA reproductive experience. My old friend Dennis Caldwell also contributed images and insights, as well as assistance with scanning some 35mm slides. And Mike Cardwell is about the nicest guy in the world! Speaking of nice guys, the author would be extremely remiss if he did not thank Harry Greene for sending me the Bogert and Roth PICA combat paper. Our photo editor Steve Barten contributed his entire Friday to converting the images in this piece to high-quality grayscale. I will forever be in debt to Mike Dloogatch and Joan Moore for their editing efforts with this piece in particular, as well as all that has gone down before (and hopefully after). The author regrets that more people could not be involved in this effort. There simply was not enough time to bring in more people than I already did. What I lament the most in this regard is not being able to weave the tremendous reproductive knowledge of Dr. Gordon Schuett, or Dr. Stephen Goldberg, into this manuscript.

Literature Cited

Amarello, M., and J. Smith. 2011. Sigma vs. the squirrel. Advocates for Snake Preservation website. <https://www.snakes.ngo/sigma-vs-the-squirrel>

Babb, R., V. Boyarski and J. Mitchell. 2020. *Pituophis catenifer* Gophersnake. Pp. 302-317. *In*: A. C. Holycross and J. T. Mitchell, editors, Snakes of Arizona. Rodeo, New Mexico: ECO Publishing.

Bogert, C. M., and V. D. Roth. 1966. Ritualistic combat of male gopher snakes *Pituophis melanoleucus affinis* (Reptilia, Colubridae). American Museum Novitates 2245.

Cardwell, M. 2009. Trap hazard posed by beverage cans to desert snakes. Sonoran Herpetologist 22(5):52.

Repp, R. A. 2002. Gophersnake account. Tucson Herpetological Society website. <https://tucsonherpsociety.org/amphibians-reptiles/snakes/gophersnake/>

————. 2018. Of rats and snakes. Bulletin of the Chicago Herpetological Society 53(10):213-218.

————. 2020. Memo to the neighborhood roadrunners: *Leave my yard lizards alone, or else* . . . Bulletin of the Chicago Herpetological Society 55(7):147-150.

Smith, J., and M. Amarello. 2011a. Ménage à trois (part 1). Advocates for Snake Preservation website. <https://www.snakes.ngo/menage-a-trois-part-1>.

Smith, J., and M. Amarello. 2011b. Ménage à trois (part 2). Advocates for Snake Preservation website. <https://www.snakes.ngo/menage-a-trois-part-2>

Stebbins, R. C. 1985. A field guide to western reptiles and amphibians. Second edition, revised. Boston: Houghton Mifflin Company.

Suggested Reading

Holycross, A. C., and J. T. Mitchell, editors. 2020. Snakes of Arizona. Rodeo, New Mexico: ECO Publishing. 836 pp.

Minutes of the CHS Board Meeting, April 16, 2021

A virtual meeting of the CHS board of directors via Zoom conference video/call was called to order at 7:35 P.M. Board members Rich Crowley, Stephanie Dochterman and John Gutierrez were absent.

John Archer read the minutes of the March 19 board meeting, which were accepted.

Officers' reports

Treasurer: John Archer went over the March financial reports.

Membership secretary: Mike Dloogatch reported that membership was holding even.

Sergeant-at-arms: Tom Mikosz reported that 32 people had logged in for the March 31 webinar.

Media secretary: Stephanie Dochterman will be setting up a YouTube channel for the CHS.

Old business

John Archer reported that CHS website updates are still in progress.

The Traveling Animal Ban bill (HB3889) has been tabled in the Illinois House and is no longer an immediate threat.

Amelia Pollock looked into software options for handling the membership renewals and came up with three options.

New business

The Peggy Notebaert Nature Museum is looking for donations of some native herp species: corn snakes, foxsnakes, black (gray) ratsnakes, milksnakes, bullsnakes, lesser sirens, bullfrogs, green frogs, northern leopard frogs, green treefrogs, gray treefrogs, Fowler's toads.

The meeting adjourned at 9:05 P.M.

Respectfully submitted by recording secretary Gail Oomens

Advertisements

For sale: **highest quality frozen rodents**. I have been raising rodents for over 30 years and can supply you with the highest quality mice available in the U.S. These are always exceptionally clean and healthy with no urine odor or mixed in bedding. I feed these to my own reptile collection exclusively and so make sure they are the best available. All rodents are produced from my personal breeding colony and are fed exceptional high protein, low fat rodent diets; no dog food is ever used. Additionally, all mice are flash frozen and are separate in the bag, not frozen together. I also have ultra low shipping prices to most areas of the U.S. and can beat others shipping prices considerably. I specialize in the smaller mice sizes and currently have the following four sizes available: Small pink mice (1 day old—1 gm) , $25 /100; Large pink mice (4 to 5 days old—2 to 3 gm), $27.50 /100; Small fuzzy mice (7 to 8 days old—5 to 6 gm), $30/100; Large fuzzy mice / hoppers (10 to 12 days old—8 to 10 gm), $35/100 Contact Kelly Haller at 785-224-7291 or by e-mail at kelhal56@hotmail.com

For sale: publications. *That Vanishing Eden—A Naturalist's Florida* by Thomas Barbour; 1944; 250 pp., b&w photos; this renowned Harvard herpetologist's observations of his visits to Florida over 40 years in the 1900s. *Graptemys barbouri* is named after him. Barbour was friends with Archie Carr who is referred to several times. Some small pieces missing from dust jacket. First edition, scarce. (h) - $75. *The Taipan—The World's Most Dangerous Snake* by Paul Masci and Philip Kendall; 1995; 90 pp., many color and b&w photos; natural history, snakebite case histories, venom characteristics, field experiences; (s) - $40. True Blue by Geordie Torr; a l5-page article about Australia's six species of bluetongue lizards in the 128-page July-September 1999 issue of *Australian Geographic*; many excellent color photos. Contains an illustrated chart showing the seasonal activity of the shingleback based on the research of professor Mike Bull. Details the rediscovery of the pygmy bluetongue which was found in a road-kill brown snake in 1992. (s) - $l8.. *A Field Guide to the Snakes and Lizards of New South Wales* by Gerry Swan; 1990; 224 pp., color photo and range map of each species; natural history info, descriptions; (s) - $22. All in excellent condition unless otherwise noted. Postage paid for orders $25 or more, $4 for under $25. Email for complete list. Bill Turner, toursbyturner@aol.com, (303) 795-5128.

Line ads in this publication are run free for CHS members—$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to mdloogatch@chicagoherp.org.

NEW CHS MEMBERS THIS MONTH

Richard Donatelli
Melanie Hamblin-Ortiz
Sarah Lamar
John Rudolph, Jr.
Cesar Torres
Vito Valerio
Mark Vukovich
Marcus Zonis

UPCOMING MEETINGS

Until in-person meetings again become possible the Chicago Herpetological Society will be holding monthly general meetings online via Zoom webinar. A notification will be sent by email to all members who have supplied us with an email address. As has been our custom for over 50 years, the meetings will be held on the last Wednesday evening of each month. The May webinar is scheduled for Wednesday, May 26, at 7:30 P.M. Chicago time. **Dr. Eli Greenbaum**, professor of environmental science at the University of Texas at El Paso, will be the speaker. Dr. Greenbaum is the author of *Emerald Labyrinth: A Scientist's Adventures in the Jungles of the Congo*. The title of his talk will be "Mambas, Malaria and Militias: 21st Century Herpetology in Democratic Republic of Congo." The talk will explain the challenges for fieldwork in Central Africa, including poor infrastructure, tropical disease, and armed militias. Evolutionary genetics studies of toads in the Congo Basin reveal that the lowland rainforests are surprisingly rich in unrecognized species, many of which are endemic to tiny areas sandwiched between rivers. We will also hear the story of a fortuitous observation by an undergraduate leading to the world's first known example of a frog mimicking a venomous snake.

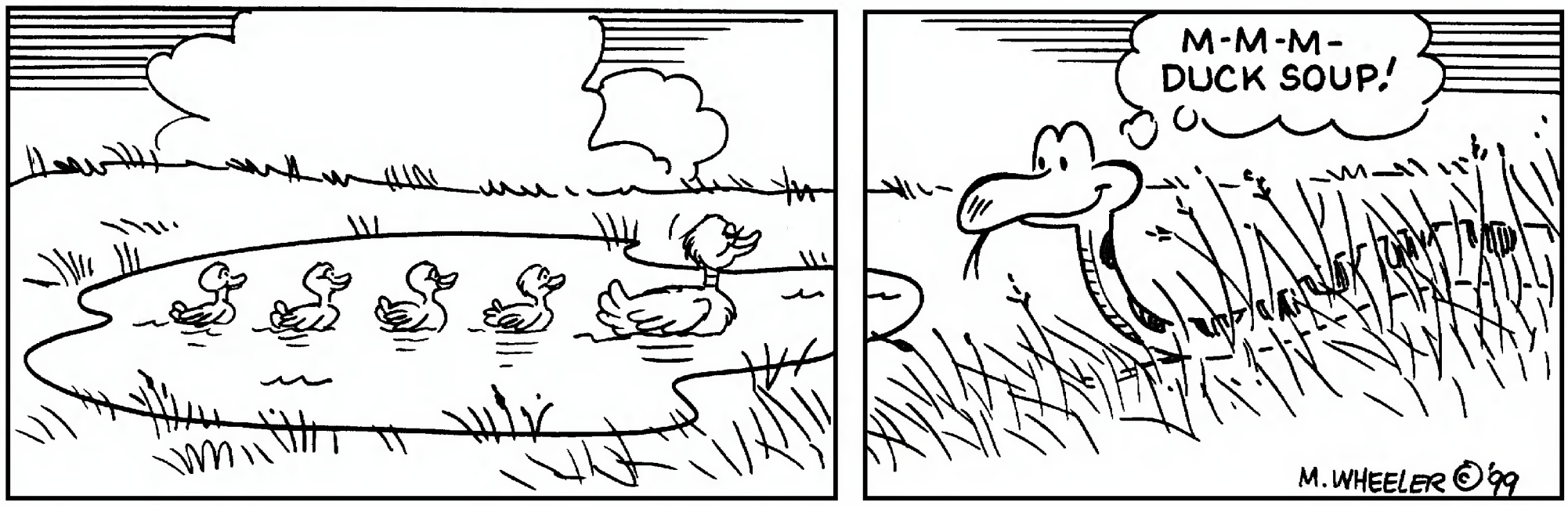
The June 30 webinar will be **Show & Tell**. The speakers will be you, the members of the Chicago Herpetological Society.

Please check the CHS website or Facebook page each month for information on the program. Information about attending a Zoom webinar can be found here:
<https://support.zoom.us/hc/en-us/articles/115004954946-Joining-and-participating-in-a-webinar-attendee->

Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? The next board meeting will be held online. If you wish to take part, please email: mdloogatch@chicagoherp.org.

THE ADVENTURES OF SPOT



Periodicals Postage
Paid at Chicago IL

CHICAGO HERPETOLOGICAL SOCIETY

Affiliated with the Chicago Academy of Sciences

2430 North Cannon Drive • Chicago, Illinois 60614